

FRIDAY, SEPTEMBER 21.

CONTENTS.

ILLUSTRATIONS:	PAGE.	PAGE.	
Robinson-Wharton Switch...	616	NEW PUBLICATIONS.....	625
Sleeping Car Routes of Europe	617		
Halls Automatic Coupler.....	618	GENERAL RAILROAD NEWS:	
Pony Lattice Bridge, West		Meetings and Announcements.....	627
Shore Railroad.....	619	Persons.....	627
CONTRIBUTIONS:		Elections and Appointments.....	627
Pools Again.....	615	Old and New Roads.....	628
Employing Brakemen.....	615	Traffic and Earnings.....	629
Fuel Gas for Locomotives.....	615	MISCELLANEOUS:	
EDITORIALS:		Technical.....	621
Wheat.....	622	Foreign Technical Notes.....	620
Fast Freight Service.....	623	Railroad Law.....	626
Location of Locomotive Works	623	The Scrap Heap.....	621
Gas Fuel for Locomotives.....	624	Illinois Railroad in 1887.....	616
European Steel Rail Syndicate	624	Contour Maps.....	618
EDITORIAL NOTES.....	622, 624	Scales for Turnouts.....	618
		Hodge's Universal Freight Tariff.....	620

Contributions.

Pools Again.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The troubles on the Granger roads attributed partly to the abolition of pooling and the present unsatisfactory condition of all associations, has brought up again the subject of pools, while in a number of articles in your admirable journal you have presented the arguments in favor of that system. This leads me to call attention to Chairman Blanchard's article on the subject in the August *Forum*. It seems to me to mark a distinct advance in the discussion. After defending pools by arguments more or less familiar, Mr. Blanchard advocates giving permission to carriers to form a combination of which the division of tonnage or earnings shall be the prominent feature, but all under the Inter-state Commerce Commission. It is proposed that all agreements be registered with that body, and subject to their approval, and that the results be publicly filed in the same way, allowing the Commission to pass upon the tariffs made by the pools before they shall be put in force. It will be noted that this is quite different from the old plan of responsibility only to the railroads concerned, and implies that such a pool without government supervision cannot again be expected.

The marrow of Mr. Blanchard's argument is thus stated: "If 50 cents is a reasonable rate from Chicago to New York on a barrel of flour, what difference can it make whether this 50 cents is taken by one road or divided between many? This question has never been answered and cannot be." No one can offer any objection under the conditions, but the whole matter is involved in that little "if." How are we to determine whether 50 cents is a reasonable rate? In one of two ways; either by competition which may sometimes be disastrous to both merchants and carriers, or through the decision of some controlling body. The former is the theory of the present law, the latter involves such a bureaucratic supervision of rates as we find in Continental Europe. The value of Mr. Blanchard's contribution is that the ground is cleared for a better view of our position. It would be well for all of us, friends and foes of pooling alike, to stop and consider whether our views logically tend. That the present condition of railroad associations is about as unsatisfactory as it can be is apparent; whether we are willing to accept the other alternative is the question. It is not easy to choose.

There are not wanting indications that Mr. Blanchard's proposition is in line with public sentiment. An observer cannot fail to notice the increasing tendency to magnify the office and duties of the Inter-state Commission. The Commissioners have now more business under the Inter-state act than they can properly attend to. The telegraphs will be added to their list, while the amendments proposed include underbilling, powers to ascertain and award damages, and most comprehensive of all, they will be required to see that the law is everywhere obeyed. At this rate the growth of the commission to regulate commerce into a full-fledged department of the government is possible and indeed probable. Possibly by that time the decisive power of fixing rates may be in their hands also. If so, the plan of restoring pooling under such a commission would introduce no new principle. If such a commission should decide that 50 cents was not a reasonable rate, but that 25c. or 30c. was, what would be said of "confiscation of private property by government?" We are far enough away from that now, but it is well to give an occasional thought whither we are drifting.

JUDEX.

Employing Brakemen.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have given this subject much consideration, and I am convinced that conductors should employ and discharge their brakemen. It too frequently occurs that a brakeman receives his appointment, and is retained in his position because he is the friend of the train-master, yard-master, or some dispatcher. Or else, he presents to the Superintendent a letter from some one who dares write, "Put this man on as a brakeman," knowing that his command will be complied with. The man's qualifications—his fitness for the position—

are not considered at all. "The power behind the throne" demands the appointment, and it is made. If the writer of the letter would say to the applicant for position, "I cannot keep you there unless you attend to your work, and your promotion must depend on your own exertions," it would be all right, but instead, anxious to show his influence, he says, "That letter will give you the appointment; they dare not refuse any request I make." That bit of information destroys the man's usefulness, because, in the majority of instances, he relies on his "pull" instead of his own exertions to keep him in his position. It is this man who frequently gets left, who shirks his work, is constantly wrangling with the rest of the crew and who upsets all calculations when good, sharp work is to be done. Having no interest in his work he is seldom in the right place when most wanted, and he keeps the conductor in constant fear of wrecks, wheels off the track and switches thrown wrong or left open.

Who is to blame for this? The conductor. I do not object to green men. We all have to learn, but when a conductor sees that a man takes no interest in his work, makes no effort to learn, he should not hesitate to go to the official who assigned the man to his train and demand in a respectful but very positive manner that the man be changed to some other run, giving his reasons for the request, and, if necessary, carry the matter to the superintendent. A conductor who retains such a man on his train simply because of his aversion to carry the matter up does an injustice not only to himself and his crew, but also to good men out of employment by retaining a man who never would make a brakeman. Furthermore he increases the risk of personal injury to every man on his train. It is an old and true axiom, "Show me a good conductor, and I will show you a good crew." A good conductor will not tolerate a man on his train that does not take an interest in his work. He realizes that by so doing he jeopardizes his own position. You rarely find a good brakeman in the man who is not looking forward to promotion; he may do his work, but it will not bear comparison with the work of the brakeman who is anxious for advancement and striving by his own exertions to gain it. Railroading is like book-keeping. The system, as learned from a book, is not what is found in practice.

How frequently one hears the remark: "Observe strictly the rules and you would never get over the road." It is the practical experience that is so essential to the successful man's advancement, and this the brakeman who is not looking forward to promotion never acquires. If conductors employed their brakemen there would be fewer brakemen out of employment, consequently fewer tramp brakemen. They would understand that their positions depended entirely on their own efforts to satisfactorily perform their duties to the approval of the man who had an opportunity to observe their every movement, and therefore the one most competent to judge their worth. There would be no shirking of work; no kicking against the conductor; no such remarks as "You didn't hire, and can't discharge me." There would be not only better brakemen, but also more efficient conductors.

When a conductor takes a leave of absence, his most competent man should be permitted to take the run. This gives him an opportunity to prove his ability to fill a higher position, and if he is successful, the superintendent knows just where to find a competent man, thoroughly familiar with the road, when he requires a conductor. It is also an incentive for every brakeman to familiarize himself with the duties of each man on the train, the rules, schedule and train orders, knowing that at any time he may be called upon to run the train. Conductors would take an interest in their men; would educate them to the business. A man would seldom change from one crew to another. Under the present system, the conductor will not take the pains to instruct his men, because they are changed from one crew to another too frequently. He realizes that he is simply breaking in men for the benefit of some other conductor, so he concludes, either to get along as best he can, or else, to keep changing until he gets one who does fairly well.

Another point: a brakeman wants a few days off. He goes to the train master, requests, and is granted leave of absence, and a man is assigned to the run. He may be all right, but the chances are that he is a man who might better be left behind and the train go out short-handed. The conductor knows nothing of the change until it is too late to make any remonstrance. This is wrong, and could not occur if the conductor appointed his men, and train masters would not be annoyed by brakemen claiming that runs had been given to men, to which other men longer in the service were entitled.

LANGDON.

Fuel Gas for Locomotives.

SHARPSVILLE, Mercer County, Pa., Sept. 11, 1888.
TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice the comments of the *Gazette* of Sept. 7, on a report made by a "Master Mechanic of 30 years' experience," in the matter of somebody's project for using "gas" as fuel for locomotives.

You say: ". . . the immense space occupied by the gas would be a formidable objection" to the scheme: this in connection, obviously, with assumption that the tender of the locomotive should carry gas, equivalent, as fuel, to six tons of coal (sufficient, ordinarily, to a train-run of about 180 miles); and that the gas would be carried at ordinary city-service tension; under which circumstances (supposing the Master Mechanic's figures, regarding quantity of gas equivalent to six tons of coal, to be correct), a tender-tank of 33,000 cu. ft. capacity—equivalent to that of a reservoir

"9 ft. in diameter and over 500 ft. long" would be necessary.

In serving fuel-gas to locomotives the gas would be charged under pressure of 200 lbs. or more into "portable" tanks, arranged to be swung on to and off the tender at fuel stations by a crane. In current railroad practice the coaling of locomotives *en route* is, as a rule, impracticable. Coaling involves a special trip of the engine to a coal-chute or bucket platform, and with a view to convenient operation and economy of time, a tender is made to carry as much coal as it safely may in addition to its load of 10 to 12 tons of water. But with gas-fuel in use, the fuel supply may be renewed—without the clutter and dust attending the coaling of an engine—in less time than that now consumed in "taking water," and there will be no necessity for carrying the equivalent of 6 tons of coal.

"Of natural gas of average quality, or say that of the Pittsburgh field, the heating power of which is about 10 per cent lower than that of the Findlay field, a quantity having in actual service a heating capacity equivalent to that of 12,000 lbs. of good bituminous coal may be charged into a tank 9 ft. in diameter and 47 ft. long. But as there would be no need to carry gas fuel in excess of an equivalent to 6,000 lbs. of coal, the service tank may conveniently be made 9 ft. wide, 25 ft. long and 6 ft. 8 in. deep, to accommodate which the tender carriage would have to be somewhat longer than that now ordinarily used. To carry 3,000 gallons of water a tank needs to have 401 + cub. ft. capacity. The water tank used with the flat gas tank specified would extend all across the tender floor, and with 25 ft. of length and 9 ft. of width would be only about 21 in. deep. The gas tank would be set on top of the water tank.

The gas (natural) equivalent to 6,000 lbs. of coal would weigh 1,931 lbs.; so the gas-tank may weigh 4,069 lbs. and not make the *fuel-load* exceed in weight the coal instead of which it is to be carried. Transportation (by rail) of the *tanked* gas, handling at coaling stations included, would not cost as much as like transportation and handling of equivalent coal. The gas may be economically delivered at fuel stations, within certain limits, by piping; and, when piped, the well pressure will charge the tanks.

Natural gas is now found in great quantity throughout wide regions in this country, and a gas-fuel service may be, with great advantage to the roads and all affected, established on each of the several great lines of railroad traversing or touching one or more of these regions. The gas companies could well afford to supply the fuel at rates bringing it entirely within the limit of cost to which the railroad companies would, in view of the numerous advantages which they would enjoy through use of the gas, be warranted in going, and scientific research and sufficient experiment have proved the entire feasibility of artificially producing from coal, and some other substances associated, a gaseous fuel, practically equivalent to natural gas, which may be supplied at prices no greater than those at which the natural gas is now delivered on a large scale to manufacturing establishments.

As natural gas has heating power about four times as great as that of the ordinary coal gas of commerce, and as a gas fuel equivalent to natural gas may, as aforesaid, be economically produced, whenever there is a suitable supply of coal, those advocating the use of gas fuel in locomotives should turn their attention to means for producing the substitute for natural gas whenever such production is, or may hereafter become, necessary; and meantime depend, for a satisfactory accomplishment of their ends, upon natural gas. Ordinary retort gas will not serve their purpose. Some of the advantages to be attained in locomotive practice by use of a proper gas fuel are set forth in the specification forming part of letters patent of the U. S., No. 164,915, dated June 29, 1875.* This patent was taken out by myself, for appliances and means for burning natural gas as fuel in locomotives, and for "inducing economy in the application of coal for steam-producing purposes generally."

The first piping of natural gas for use as fuel in manufacturing was done in 1874; the well (in Butler County, Pennsylvania) then tapped was still producing gas in large quantity. Natural gas came into notice as an article of commercial value somewhere about 1880. Government reports state the value of this gas produced in 1882 at \$215,000, in 1885 at \$4,854,200.

In 1865 I carefully observed a certain burning gas-well in Venango County, Pa., and afterward another in West Virginia, and was impressed by the clearly obvious fact that at each of these wells a fuel-supply equal to the running of scores of locomotives was hourly going to waste. Hence the devices described in the patent, wherein the gas is to be burned by jets in feed-pipes, preferably water-jacketed, fixed in and extending throughout the length of the flues of the boiler, which flues in case of the locomotive would be made considerably larger than those now in use. The locomotive boiler, constructed with view to gas burning, would have a plain cylindrical shell without fire-box. Herein is an immense reduction of cost and increase of serviceableness. The back pressure now due to blast would be entirely done away with. Draft, when in motion, would be produced by suitable arrangement of pipe in exhaust chimney; when standing, a suitable blower to supply necessary air for combustion would be used. Great economy of fuel would be obtained through the use of the arrangement described in my patent whereby the gas may, at will, be shut off from one or more sets or series of the boiler flues, as circumstances may render such restriction of heat desirable.

Observe, moreover, the very many conditions favorable to economy and safety and comfort of passengers, induced by the use of gas fuel in locomotives: The fireman would be re-

*"Application" filed June 29, 1874.

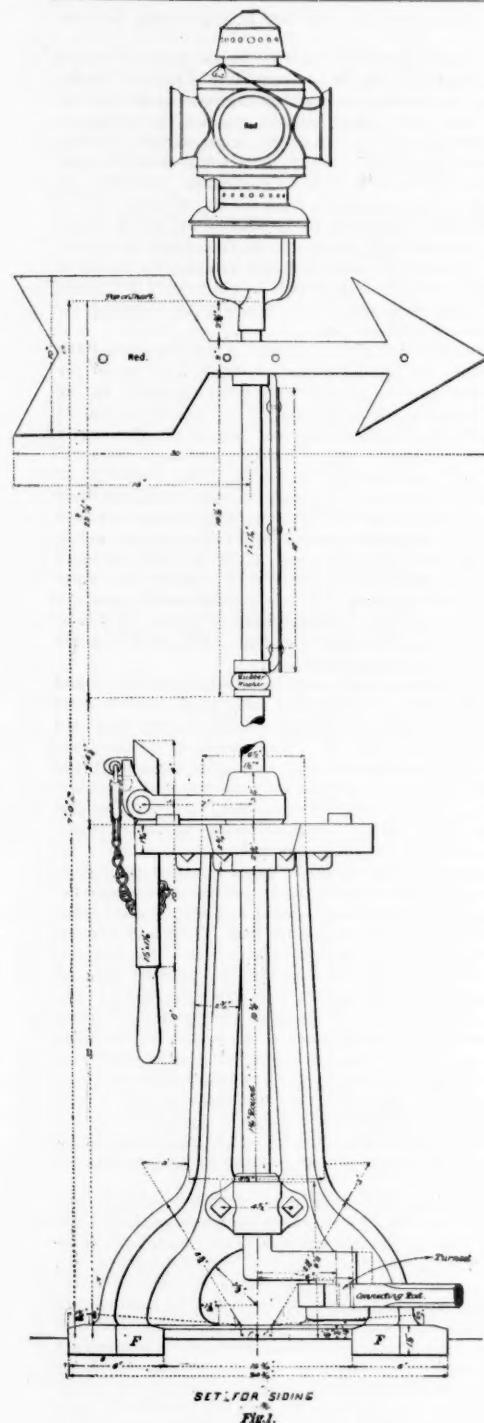


Fig. 1.

placed by an apprentice-engineer; there would be no cinders, no fire-box cleaning of the kind for which ash-pits and water work fixtures are now necessary; no cracked fire-box sheets; no coal grit on slides and journals; no fences burned, nor crops nor bridges destroyed; no varnish "pumiced" off coaches by cinder-grit; no "extended smoke-arch," and no spark-arrester rigging; no nasty smoke, no scrapping of parts of an engine to accommodate fire-box. And, in very many particulars, appliances and operations in the locomotive and car departments would be, by introduction of gas fuel, simplified and improved.

In Western Pennsylvania there are incorporated some 50 natural gas companies. There is large promise of natural gas in Kentucky, Indiana, Illinois and Missouri. In Ohio the product is large. The gas may be economically piped, for large business, 25 to 30 miles. Leakage is the great difficulty to be overcome in long service pipes. In manufacturing the substitute for natural gas the works would be at the coal mines, the product piped thence to points within reach by such means.

JOHN M. GOODWIN.

The Robinson-Wharton Switch.

We give herewith illustrations of this switch, which is a combination of the Robinson stand with the Wharton switch, with "safety" appliances omitted. It was designed two years ago by A. A. Robinson, Chief Engineer (now also Second Vice President and Manager) of the Atchison, Topeka & Santa Fe, and is now in use on the main line of the Chicago, Santa Fe & California, from Chicago to Kansas City, and on the newly-constructed lines in Kansas, Indian Territory, Colorado and Texas. The points of merit claimed for this switch are, in brief, as follows:

1st. A strictly unbroken and undisturbed main track. This, of course, is a feature of all Wharton switches, and is in no way modified by the Robinson stand.

2d. A connecting rod without bolts, nuts, cotter pins or other loose parts at either end, and that cannot be maliciously dis-

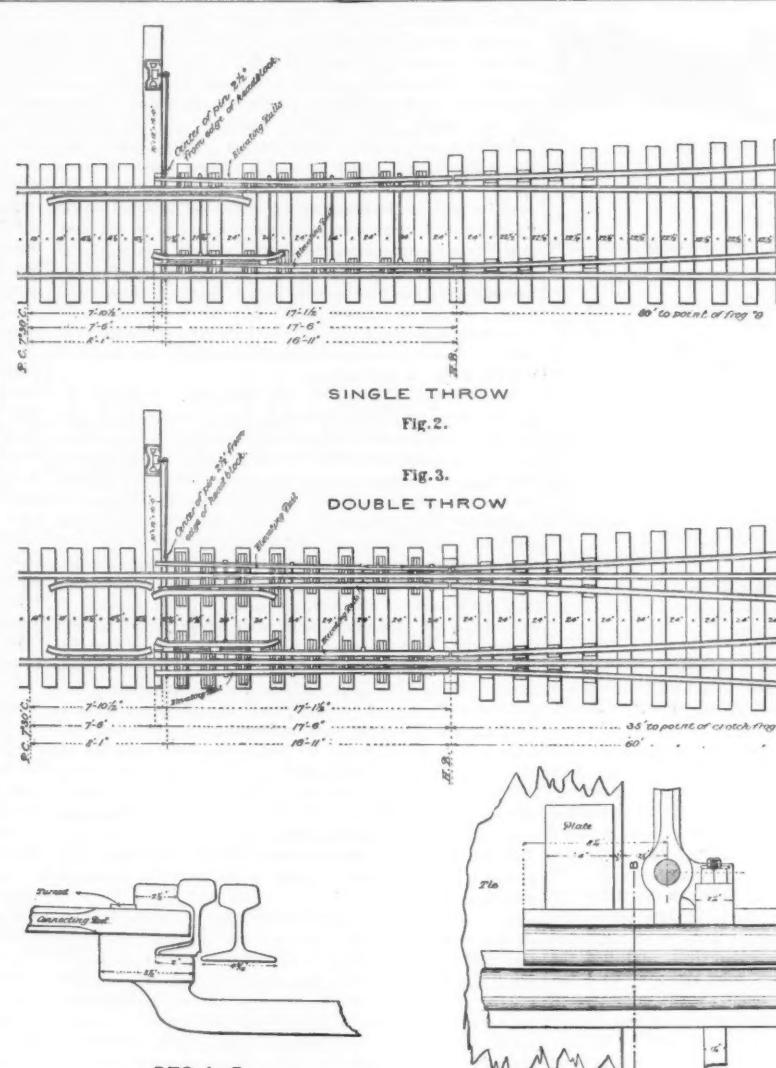
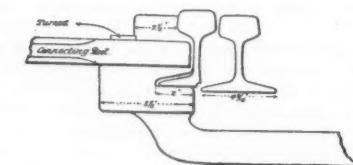


Fig. 2.

Fig. 3.
DOUBLE THROW

SEC. A-B

THE ROBINSON-WHARTON SWITCH.

placed without first unscrewing and removing the stand (see figs. 1, 4, 5 and 6).

3d. The flanges F F (fig. 1) depend upon the edge of the headblock and so determine the position of the stand in the direction of the main track, so that the centre of the joint or pin at the rail (fig. 5) is exactly abreast of the centre of the crank or stand shaft when set for main track, thus insuring equal and exact throws of the switch rail regardless of the length of the connecting rod.

4th. The turned eyes of the connecting rod avoid the loose motion so often found at a switch and the consequent jog in the main track and the "ears" or "lips" on the rails.

5th. The large saving of expense in placing and repairing switches due to an undisturbed main track, exact throws, and positive and certain movement of the switch rails.

We will not here describe further the patented points of the Robinson stand, the aim being now simply to call attention to the combination of the Robinson stand with the Wharton switch (without "safety" appliances) as being the result of many years' experience of one of the best known railroad engineers and managers.

The Illinois Railroads in 1887.

Advance sheets have been received of the introduction to the annual report of the Illinois Railroad and Warehouse Commission for the year ending June 30, 1887. Fifty-six roads reported, with the following aggregate mileage:

Main line and branches	9,870.37
Double track	599.34
Side track	1,801.72

Total mileage in Illinois 12,271.43

The entire length of railroads reporting to the Board, including main line, branches, leased lines, double track and sidings, is 36,180 miles.

"The capital stock of the fifty-four railroad corporations so reporting to this Board this year is \$707,721,708, being a decrease from that of last year of \$6,411,525. This decrease is owing to the fact that some of the larger roads have passed into the hands of receivers, who have no means of showing the details of the issue of stock."

The aggregate of capital stock and bonded and floating debt of all the roads reporting to the Board was \$1,502,872,725, and the cost of road and equipment was \$1,452,564,615.

"The income of all railroads reporting to this Board for the year is as follows:

Passengers	\$60,324,938
Freight	152,724,321
Other sources	5,667,825

Total \$218,717,084

"Which result, as compared with 1886, is an increase in earnings of \$19,766,909.

"The above total does not include the earnings of the Chicago, Burlington & Quincy west of the Missouri River, the earnings of the Illinois Central Land Office in New York and the land receipts, nor the income from investments of the Louisville & Nashville.

"The following table shows the earnings, gain and loss from previous years, and the per cent. of gain and loss for the last 6 years :

Year.	Gross earnings.	Inc. or Dec.	P.c.
1882	\$189,352,978	I. \$13,279,728	7.5
1883	214,146,915	I. 24,793,937	11.50
1884	210,228,068	D. 3,918,846	1.86
1885	199,123,334	D. 11,104,734	5.28
1886	198,950,174	D. 173,159	.86
1887	218,717,083	I. 19,766,908	9.90

"The following table shows the total passenger and freight earnings for the last six years:

Year.	Passenger.	Freight.
1882	\$52,782,992	\$126,707,839
1883	59,365,804	138,077,180
1884	61,390,172	143,062,033
1885	58,334,881	136,148,198
1886	57,320,355	135,330,218
1887	60,324,937	152,724,320

"The gross earnings for Illinois business for the year ending June 30, 1887, were \$56,860,287.34, of which \$15,385,945.66 was from passengers, \$38,524,367.55 from freight and \$2,948,974.13 from other sources. These figures show an increase over last year's business of \$1,182,936.28.

"The total of operating expenses and taxes paid in Illinois during the year was \$35,366,302.19.

"Fifty-four roads reporting show an aggregate gross profit of \$21,455,506.03, and six roads show an aggregate gross loss of \$99,459.88.

"Eleven corporations paid dividends during the year ending June 30 amounting to \$21,325,803.21; while in 1886, eleven corporations paid dividends amounting to \$19,480,914.96, and in 1885, ten corporations paid dividends amounting to \$20,175,311.86."

The traffic of the roads reporting was, in the fiscal year :

	Total.	In Illinois.	per unit.
Passenger	56,586,104	26,294,675	2.39 cents.
Tons freight	103,805,081	38,819,675	1.48 "

"The following table shows the comparative number of tons of freight carried by the leading Illinois roads during the years 1886 and 1887 :

Name of company.	Whole line.	In Illinois.
C. & A.	3,567,833	3,047,882
C. & N. W.	8,519,355	9,844,534
C. B. Q.	5,612,888	7,436,582
C. M. & St. P.	6,549,004	7,344,190
Ill. Cen.	3,653,878	4,499,075
L. S. & M. S.	7,857,938	8,984,679
Mich. Cen.	5,225,490	5,767,724



THE SLEEPING CAR ROUTES OF EUROPE.

"The total number of persons killed by accidents within the state during the year was 436, and the total number injured was 957.

"Of the above number of casualties, 297 resulted from coupling and uncoupling cars.

"The Chatsworth accident, in which 83 persons were killed and 151 injured, is not included in the above statement."

The average passenger and freight earnings per mile (whole line) of the leading railroads in Illinois, is as follows:

Name of company.	Pasenger.	Freight.
C. & A.	\$3,200.49	\$6,733.23
C., B. & Q.	2,673.55	7,076.90
C., R. I. & P.	2,517.05	5,898.91
C. & N. W.	1,645.14	4,780.56
C. M. & St. P.	1,356.20	3,514.66
Ill. Central.	1,387.18	3,735.47
O. & M.	2,565.09	3,907.53
S. E. & St. L.	2,210.17	4,991.50
T. H. & I.	3,831.54	6,691.16
W., St. L. & P.	1,319.47	3,470.33

The Commission reviews at length the discussion and negotiations in the matter of the local Illinois rates as affected by the Inter-state rates. Complaint was made against the railroads doing business in Illinois, charging that they were practicing unjust discrimination against the Illinois jobbers and manufacturers, in favor of their non-resident competitors; that the local Illinois rates were extortionate, and that the discrepancy between state and inter-state rates was unjust and injurious. The Board, with a view of adjusting the matter as far as practicable, proceeded to devote a large amount of time, in company with the representatives of the merchants, shippers, manufacturers and many of the officers of the leading railroad companies, to the investigation of the subject, and in hearing a great deal of evidence. The Board, after such investigation, proceeded to make reductions in the maximum rates on a good many of the articles which are brought into the state, and which constitute a considerable part of the goods handled by the traders and manufacturers, by whom complaint was originally made—by changes in classification. The action, it is hoped, will relieve to a considerable extent, the causes of complaint arising from the new condition of things, which, to some extent, was caused by the passage of the Inter-state Commerce law. If the local rates in Illinois are found to be too high, they can be reduced as the facts which may require such action, are brought to light.

The railroads are for public use and service as well as for private profit. The public are not only entitled to service without unjust discrimination and at reasonable rates, but are entitled to ample accommodations and facilities for the transportation of their property on these public highways,

and also to have their persons transported in comfort and safety. They are entitled to good, safe and comfortable coaches; good, sound and safe road-beds, bridges and culverts; skillful, careful and faithful engineers, and careful conductors, brakemen and trackmen. All of these are of as much importance as low freight or low passenger fares. These all cost money and must be provided for out of the earnings of the railroads before dividends can be paid to the owners, and before sweeping reductions of maximum rates can be reasonably demanded. The reports of the Illinois railroads show that with most of them a reduction of maximum rates would prevent further immediate repairs and betterments of the railroad tracks and equipments, and would require reduction of expenses in many directions, among which would be the wages of the vast number of persons now employed by the railroad corporations, only a few of which corporations are now making more than running expenses, taxes and interest. A reduction of wages would probably result in employing cheaper men, and consequently less skillful and efficient service would be rendered, which would result injuriously to the public no less than to the owners of the railroad property.

In conclusion, the Commissioners say that, during the year, the tendency in freight rates had been downward; much lower through rates, and, to some extent, lower local rates, have been reached on most of the lines of railroad in Illinois, and the patrons of the railroads are generally less disposed to complain of the treatment they receive from the managers of the railroads than during any former year since the Railroad and Warehouse Commission was created.

The Sleeping Car Routes of Europe.

The accompanying sketch map shows that sleeping cars are being extensively used in Europe, and that on many long journeys dining-cars are also used.

The cars of the Compagnie Internationale des Wagons-Lits (International Sleeping Car Company) are in most general use on the continent of Europe, and the routes taken by their cars are shown in the map. The cars used resemble in general plan the Mann car.

In England Pullman cars are principally used, though some of the railroads run their own cars, the London & Northwestern having taken the lead in this respect.

Several special long-journey trains are run on the Continent for the special benefit of through travelers. One which has been running for some years is the "Indian Mail," which conveys passengers and mails for India, China and Australia. It starts once a week from Calais, and runs through without

change to Brindisi, the old Roman port in the south of Italy, where passengers embark for the East via the Suez Canal. The train skirts Paris and passes through the Mont Cenis tunnel, the whole journey taking 48 hours. The entire distance is about 1,300 miles, so that the rate of speed is not excessive.

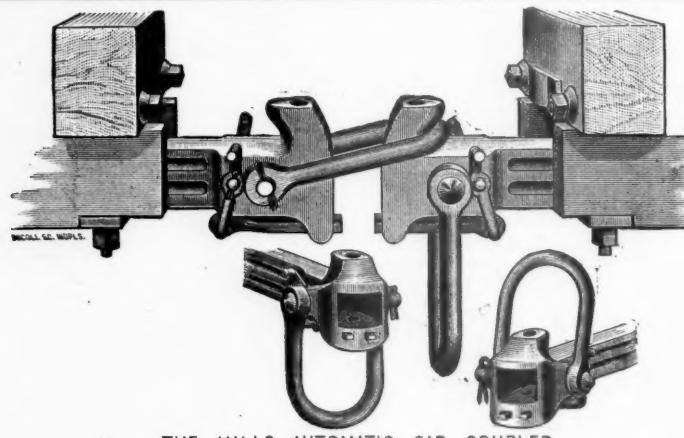
Another train to the East has Constantinople as the objective point. It runs daily between Paris and Vienna and is continued to Bucharest and Constantinople on two days of every week, but it is understood that a daily service is contemplated. The whole distance is about 1,750 miles, and the time at present is about 73 hours.

Similar dining or hotel car trains, termed *trains de luxe*, are run from Paris to Lisbon on two days in the week. The break of gauge involves, however, a change of cars at the Spanish frontier. This train is also run in connection with ocean steamers to Brazil, the Cape of Good Hope, etc. The remaining trains corresponding to our limited comprise the Pyrenees express running from Paris to Pau and Pierrefitte twice a week during the summer, and the Mediterranean express running between Paris and Monte Carlo and Mentone during the winter.

All the above trains are wholly composed of sleeping, dining and parlor cars. The latter are fitted with reclining chairs and smoking lounges. The meals are served à la carte or table d'hôte. In the latter case, the breakfast consists of coffee, tea or chocolate with new rolls and butter, the charge for which modest repast is 2 francs, or about 38 cents. The luncheon, as becomes continental habits, is more luxurious and consists of eggs or fish, meat, vegetables, cold meat and dessert, the charge varying from 3½ to 5 francs (66 to 95 cents) on different services. Dinner consists of soups, hors d'œuvre, fish, two kinds of meat, vegetables, sweets and dessert, the charge without wine varying from 95 cents to \$1.33.

On many of the ordinary express trains passengers with second-class tickets can use the dining and sleeping cars. This arrangement may seem somewhat singular, but the third class there is practically equivalent to our first class; that is to say, the great majority of passengers travel by that class. The second class corresponds to our parlor and reclining chair or ladies' cars, and the first class is largely used by the millionaires who would travel in a private car here. Fast trains in France are often wholly composed of first class cars, so that the extra fare for the higher class is often paid for the speed rather than the comfort of traveling.

The routes of the ordinary express trains on which sleeping, dining or parlor cars are run in Europe are shown be-



THE HALLS AUTOMATIC CAR COUPLER.

low. The list is probably incomplete, though every endeavor has been made to avoid errors.

		SLEEPING CARS.....	DINING CARS.....	PARLOR CARS.....	NUMBER OF TRAINS WHICH USE DRAW-BAR.....
England	London—Liverpool	Yes	Yes	One.	
"	" Glasgow	Yes	Yes	Two. [†]	
"	" Edinburgh	Yes	Yes	Two. [†]	
"	" Manchester	Yes	Yes	One.	
"	" Edinburgh—Perth	Yes	Yes	One.	
"	" Glasgow—Greenock	Yes	Yes	One.	
"	" Stranraer	Yes	Yes	One.	
"	" Brighton	Yes	Yes	One. [§]	
"	Perth—Inverness	Yes	Yes	One.	
"	London—Liverpool	Yes	Yes	One.	
"	" Manchester	Yes	Yes	One.	
"	" Holyhead	Yes	Yes	Two.	
"	" Glasgow	Yes	Yes	Three.	
"	" Greenock	Yes	Yes	One.	
"	" Perth	Yes	Yes	Two.	
"	" Stranraer	Yes	Yes	One.	
"	" Edinburgh	Yes	Yes	One.	
"	Liverpool—Glasgow	Yes	Yes	One.	
"	" Perth	Yes	Yes	One.	
"	Manchester—Perth	Yes	Yes	One.	
"	Liverpool—Bristol	Yes	Yes	One.	
"	London—Plymouth	Yes	Yes	One.	
"	" Leeds	Yes	Yes	Two. [†]	
"	" Manchester	Yes	Yes	Two.	
France	Calais—Bale	Yes	Yes	One.	
"	Paris—Bale—Vienna	Yes	Yes	Two.	
"	" Rouen—Havre	Yes	Yes	Two.	
"	" Brussels	Yes	Yes	One.	
"	" Trouville	Yes	Yes	One.	
"	" Lille	Yes	Yes	One.	
"	" Montlucon	Yes	Yes	One.	
"	" Marseilles	Yes	Yes	One.	
"	" Geneva	Yes	Yes	Two. [*]	
"	" Turin—Rome	Yes	Yes	One.	
"	" Cologne	Yes	Yes	One.	
"	" Frankfort o. M.	Yes	Yes	One.	
Belg'm, etc.	Ostend—Bale	Yes	Yes	One.	
"	" Brussels—Verviers	Yes	Yes	One.	
"	" Liessing—Venlo	Yes	Yes	One.	
"	" Calais—Cologne	Yes	Yes	One.	
Germany	Frankfort o. M.—Bale	Yes	Yes	One.	
"	New Strelitz—Warnemunde	Yes	Yes	One.	
"	Frankfort o. M.—Berlin	Yes	Yes	Two. [†]	
"	Berlin—Munich	Yes	Yes	One.	
"	Mavenec—Vienna	Yes	Yes	One.	
"	Frankfort o. M.—Eger	Yes	Yes	One.	
Italy, etc.	Bale—Milan	Yes	Yes	Two.*	
"	" Milan—Florence—Rome	Yes	Yes	Two.	
"	" Turin—Milan—Pisa—Rome	Yes	Yes	One.	
"	" Rome—Naples—Reggio	Yes	Yes	One.	
"	" Naples—Naples	Yes	Yes	One.	
"	Messina—Palermo	Yes	Yes	One.	
Austria	Vienne—Berlin	Yes	Yes	One.	
"	" Prague—Dresden	Yes	Yes	One.	
"	" Frazenbad	Yes	Yes	One.	
"	" Pesth—Bucharest	Yes	Yes	One.*	
"	" Wars w.—St. Peters b	Yes	Yes	One.	
"	" Czernow—Lemberg	Yes	Yes	One.	
"	" Pontefebba	Yes	Yes	One.	
Russia	Warsaw—Moscow	Yes	Yes	One.	
Roumania	Buchrest—Jassy	Yes	Yes	One.	
"	" Galatz	Yes	Yes	One.	
Spain	Paris, Irun—Madrid	Yes	Yes	One.	
"	Madrid—Seville	Yes	Yes	3 weekly	
"	Barcelona	Yes	Yes	2 weekly	
Portugal	Lisbon—Oporto	Yes	Yes	Daily.	

* Sleeping cars on night train, parlor or dining cars on day train.

[†] Trains run by different routes.

[§] Trains start from different termini.

^{*} During summer only.

The Halls Automatic Car Coupler.

The accompanying illustrations represent a form of car coupler that have been recently introduced, having been patented March 20, 1888. The coupler is now in use on the Cincinnati, Sandusky & Cleveland; Cairo, Vincennes & Chicago; Chicago & Eastern Illinois, and Ohio, Indiana & Western. Arrangements are also being made to put it on some coal cars on the Ohio Southern.

The coupling belongs to the hook and link type, which is largely used on coal cars here, and has been to some extent experimented with on freight cars, while it is still the prevailing type in Europe. The principal objections to the hook and link type are two fold (1), it necessarily involves slack; and (2), when the cars are violently thrown together in switching, the shock tends to lift the link out of the hook, and the cars become uncoupled as they rebound.

The method by which the Halls coupler is rendered automatic is clearly shown on the illustration. When the link is above the draw-bar, as in the lower right-hand corner of the illustration, it is set to couple, for the two projecting lugs strike the opposing draw-bar and being driven back actuate

the striker behind the link and force the link down. If the link is allowed to hang beneath the draw-bar the cars will not couple.

The draw-head is arranged for the use of the ordinary link and pin. As shown in the illustration, the draw-bars are given the same slack as a link and pin draw-bar, so that a double coupling can be made by using the link and pin at the same time as the automatic link. The coupling, however, as usually made, has 2 in. less slack than shown.

The following advantages are claimed for this draw-bar:

It is entirely automatic.

It will couple with different heights of draw-bar.

It is easy to uncouple.

It does not require a loose link or pin.

The mouth of draw-bar is not changed, so that a link and pin can be used when necessary.

When link and pin is used, the automatic coupling hangs below the draw-bar out of the way.

Has double coupling. In case train breaks in two, second one can be used.

Will uncouple if car turns over. Does not require any change in draw-bar timbers. Can be left so cars will not couple together on siding.

Has no springs, and, if broken, the coupler can be taken off and replaced by brakeman as easy as a link and pin.

Any further information can be obtained of the Halls Automatic Car Coupler Co., Indianapolis, Ind.

Contour Maps in Location of Railroads.*

A wide difference of opinion exists among engineers in regard to the practical use of contour maps in preliminary and location surveys for railroads. While one engineer will consider this part of the topography of prime importance, and will insist on its being taken as accurately, and as widely as possible; another will do his locating entirely in the field, without the aid of maps, and will make the contour maps only because he is furnished the men for that purpose, and because it is required at headquarters.

Improperly used, the contour map system becomes a "vicious one," but if rightly used, it is certainly the most beneficial system. It is of great assistance, especially in a rough country, in enabling the locating engineer to find the best line. In a prairie country, where the ground is comparatively level, where long tangents can be run, and where the line may be shifted a considerable distance either way without making any great change in the earthwork, the contour map is of no great assistance; but where the line is a supported one, confined within narrow limits in location, and requiring the nicest engineering skill to keep it to maximum grade and curvature, and "get out" at the top, or "down" to the bottom, the contour map can be used to good advantage, and the necessity of backing up to re-run the line can thus be avoided.

It is essential that the man who personally superintends the location shall be the one who makes it on the contour map; for, by means of the former, he becomes familiar with the features of the ground over which the line is run. The contour map is, to him, an "intelligent image of the ground," showing the relation of distant parts to each other. In the field his view is limited to a small part of the line, and he is an exceptional engineer who is able, even after long experience, to judge accurately of the relative elevations of points some distance apart. Nor is he likely to carry in his mind the details of the ground in a day's run. Since a change in one part of the line will always affect some other part, it is necessary to know what the effects of such a change will be. If this is determined in the field, it will be a "cut and try" process, with oftentimes no better results than before; for what is gained in bettering one part of the line is lost by increasing the work in another part, thus making a third and sometimes a fourth location of this part of the line necessary. This involves delay and expense which may be avoided, to a great extent, by an intelligent use of the contour map. With the map before him, the engineer has a comprehensive view of all the details of the part to be changed, and its connection with other parts affected by such a change; being familiar with the main features of the ground, he will understand, at once, what is needed. He will not only be able to tell the effects of a change in the line and where a change can be made to produce good results, but will also be sure that the expected results will be obtained when the line is run in the field. The map will also give him notes of the irregular cross sections from which the earth-work may be computed, and a close estimate of cost can be obtained. All this may be done after supper, in camp, or while the party is in the field at work, without involving loss of time; and may avoid the trouble and expense of re-running the line. The curves may also be fitted in on the map before being staked out in the field, thus determining what degree of curve will best fit the ground, and showing whether the line would be benefited by a change at this point.

I have presupposed the contour map to be a correct one, made on the preliminary survey. Usually the located line will not vary any considerable distance from the preliminary line, so that the contour map made from the latter may be used in the location. Especially is this true of supported and

side-hill location, in which cases the contour map is of the greatest value. On one survey, from the Mississippi river out, I remember the locating engineer would make a "proposed location," in pencil, on the preliminary contour maps before sending them in. These maps were blue-printed and joined together, thus giving the locating engineer a continuous contour map of the entire line.

The method used in taking contours in the field is quite simple. Usually the topographer, with one assistant, can do the work and keep up with the party, unless the country is very rough. A hand level, level-rod and tape line are needed; also a book ruled in squares representing 50 ft. each way, with a place on the margin for notes of elevation and distance out of contours. The station of the centre line, the elevation of which is obtained from the level book, is always to be taken as the starting point. Contours showing a difference of five feet in elevation are sufficient for practical purposes, and often where the line is on a steep side hill, 10 ft. contours will be all that can be plotted on the map of the usual scale. Distances may be obtained by pacing where the slope is gentle; but if the ground is rough or steep, the tape or rod should be used to measure the distance. The contours should be sketched in by the topographer in the field, especially where the ground is broken and where there are points and hollows to be shown. The sketch can be quickly and accurately made. By means of it the irregularities are shown, and a draughtsman, who has not seen the ground, is better able to understand and correctly plot the notes.

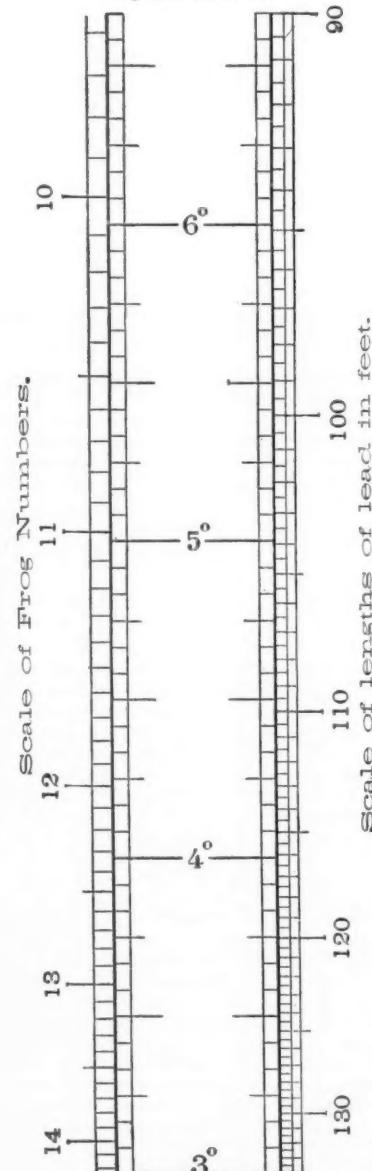
The topographer must exercise good judgment in determining where the contours should be taken at a considerable distance from the line, and where the ground should be fully and accurately shown. In fact, I think his position in the party, in point of knowledge and judgment and in importance of work, is next to that of the locating engineer; especially is this true where the contour map is used. He should be able to judge distances and elevations pretty accurately, and to show by sketch the main features of the country, outside of the limits of the contour lines; and while this work need not be artistic, it should give a good idea of lay of the country. Very often, where it is necessary to swing the line from its course, questions and explanations may be avoided by showing on the map the reasons for so doing.

Scales for Turnouts.

We publish herewith a scale designed and copyrighted by Mr. E. A. Gieseler, C. E., giving graphically the frog numbers, length of lead and degree of curve for turnouts from

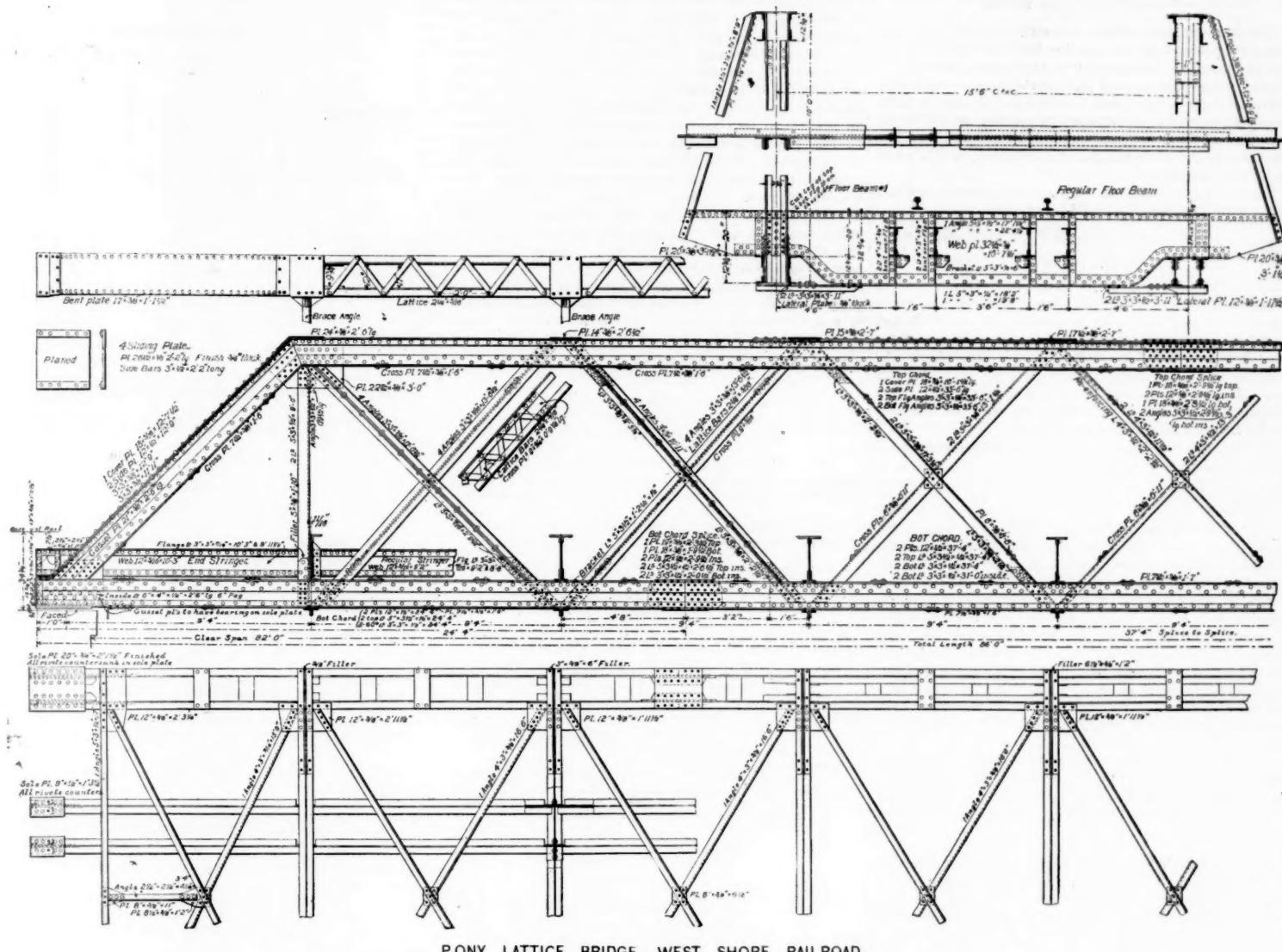
IESELER'S SCALES FOR TURNOUTS.

Degrees of Curvature.



* up to 6° 40'. The scales which Mr. Gieseler has published go up to 42° 30'. They are of curvature, calculated by the prevailing modern practice, regarding the switch-rails as part of the curve. These scales are printed on stiff cardboard and fold into convenient shape for the pocket, about 8 by 5 in. in size.

*By E. L. Morse, Resident Engineer, C. B. & Q. R. R. Reprinted from the selected papers of the Civil Engineers Club of the University of Illinois.



PONY LATTICE BRIDGE, WEST SHORE RAILROAD

The following is Mr. Gieseler's explanation of the use of the scales. The scales are for a gauge of 4 ft. 8½ in.:

Turnouts from a straight main track.—The left hand scale contains the number of frogs to tenths, the centre scale (which is double) the degree of curvature of turnout, and the right hand scale the total length of lead (including switch rail), to half feet. If, for instance, a turnout is to be made with a number 10 frog, then this number is looked up in the scale of frog numbers, and on the same horizontal line with it will be found the requisite degree of curvature and total length of lead, in this case 6° 05' for the former and 94.2 ft. for the latter. Or, if a 10° 50' turnout curve is to be made, we find that a number 7½ frog is required, and that the length of lead is 70.65 feet.

Turnouts from the outside of a curved track.—The proceeding remains precisely the same as described above, with only this difference, that the figures of the centre scale now represent the sum of degrees of the two diverging curves. For instance, if an 8° degree turnout is to be made from a 4° main track, then the sum of degrees of the two curves is 12°, and for this we find from the scale that a 7½ frog is needed, while the length of lead is 67.15 feet.

Turnouts from the inside of a curved track.—Here the figures of the centre scale represent the difference of degrees of the two diverging curves, the proceeding otherwise remaining the same as above. For instance, if a 12° turnout is to be made from an 8° 15' main track, then the difference of degrees is 3° 45', for which the scales denote a 12½ frog and a length of lead of 120 ft.

Three-way switches.—The two frogs and lengths of lead on the main track are found as above, and the crotch frog and its lead are found by considering the two turnout curves as forming a turnout themselves independent of the main track. If they deflect in opposite directions, the sum of their degrees is employed; if in the same direction, the difference of degrees.

Thus we find for an 8° and a 6° turnout deflecting in opposite directions from a straight main track: Frogs for main track, No. 8½ and No. 10.1; lengths of lead on main track, 82.15 and 94.85 ft. The sum of degrees of the two turnouts being 14°, we further have: Crotch frog No. 6.6 and length of lead for it, 62.15 ft.

These scales may be obtained of the *Railroad Gazette*, or directly from Mr. E. A. Gieseler, P. O. box 3678, New York.

A Pony Lattice Bridge—West Shore Railroad.

We publish herewith drawings of a pony lattice bridge, as built by the New York Central & Hudson River for branch lines. This particular bridge was built at Normanskill, near Albany, on the West Shore Railroad. It is 82 ft. clear span;

total length of truss, 86 ft. The clear width is 14 ft.; width, centre to centre of trusses, 15 ft. 6 in. The height is 10 ft. and weight 50 tons.

The bridge was designed by Mr. Walter Katté, Chief Engineer, and Mr. G. H. Thomson, Bridge Engineer New York Central & Hudson River Railroad. For main line bridges the floor system is of a different type.

The drawings include a cross-section of the bridge, side elevation of a truss, inverted plan of the bottom chord, etc., and some details and dimensions are given with such fullness that no further description is necessary. The dimensions are for open-hearth steel, and the designers consider the bridge well adapted to stand up in case of derailments, broken axles and other rough usage.

The Hilton Bridge Co. were the contractors.

Western Railway Club.

The first meeting of the club after the summer vacation was held at the Grand Pacific Hotel, Chicago, on Wednesday afternoon. The annual report of Treasurer W. B. Snow was read and approved.

An election of officers resulted in the re-election of G. W. Rhodes (C., B. & Q.) President, and W. B. Snow (Illinois Central) Treasurer, and the choice of John Hickey (Milwaukee, L. S. & Western) Vice-President, and W. B. Crossman (*Railway Review*) Secretary.

Mr. SMITH (*Railway Review*) gave notice of a proposition for a constitutional amendment creating the office of Second Vice-President. Messrs. George M. Sargent, Essinger and Smith were appointed a committee to see about securing permanent quarters for the club.

MATERIAL FOR CAR CONSTRUCTION.

He said in substance: This subject is wide but may be assumed to relate more particularly to the quality of materials for freight cars. At a previous meeting a number of members thought that the better car can be built in the railroad car shops; but however that may be, railroad managers at present seem to prefer to buy cars at the contract shops, and the capacity of the railroad shops is growing less and less in proportion to the equipment every year. There are about a million freight cars in this country and Canada, and they require for renewals and natural growth about 100,000 new cars every year. A large proportion of these cars are bought so that it is becoming more and more the important work of the railroad car-builders to prepare specifications and to inspect cars. For lumber it has been difficult to prepare a

specification, because it is difficult to test the sample and at the same time to use it, and it is difficult to say just what qualities are the best in lumber and to have your inspector find them or detect their absence. When I first found this difficulty, I made some effort with a committee of the Master Car-Builders' Association to have them adopt a standard bill of material for cars, so that the contract shops could carry in stock sufficient lumber to season a year or two and give us good dry lumber in our cars. That measure was defeated on a vote by cars, but taking a vote by roads there were 54 roads in favor of it and 25 roads opposed. The vote by cars was 273 to 240. This shows that there are a good many who think that this standard bill of material was a good thing. There are quite a number here who voted against the measure, and I think it would add interest to the discussion if they were to give their reasons for opposing it. Our chemist has been continuing his investigations on the amount of moisture in lumber in different stages of its seasoning, and we hope before long to be able to specify and to successfully inspect lumber for seasoning. At present all we specify is in the usual formula for flooring and sills, that it must be free from large splits, shakes, large knots and bark edges. The maximum amount of sap at any section and its position is shown in scales. We also say that it must be seasoned at least one year before it is used in the cars. In our yards we keep it as long as we choose for the few cars we build. Another incidental point is the covering for the tenons and other joints; some specify white lead, others mineral paint, and others the various forms of wood acids. We have lately changed our specification for painting iron; we use two coats of mineral paint instead of lamp-black. We found that it was perfectly useless to paint wheels and parts of a truck a good bright black color and start them out on a muddy road; they came back brown with mud. We now paint them pretty nearly that color to begin with. The different forms and materials for roofing constitute an important department. The plastic, the asphaltum and the felt roofs are gaining the ascendency. We have found in a short use of some of the pitch roofs that those which harden and become brittle are not easily repaired, for when the top boards are torn off they tear the second layer, and perhaps some other part of the car.

In the discussion which followed, Messrs. Snow, McKenzie, Barr, Hickey, Samuel Pullman and Cushing participated.

A motion was carried changing the day of meeting to the Tuesday preceding the last Thursday each month. Messrs. Barr, Smith and F. F. Bennett were appointed a committee to arrange for the publication of reports of meetings. Adjourning.

[Page 160.]

LIST OF

NEW ENGLAND STATIONS
FROM WHICH THIS TARIFF APPLIES.
ON WESTBOUND FREIGHT
IN ANY QUANTITY,
subject to the following:

- a Only for full car-loads.
b Only for full car loads, except specified articles covered by commodity tariff.

STATION.	STATE.	ROAD.
Acton	Mass.	Old Colony
<i>a</i> Agamenticus	Maine	Boston & Maine
Albion	R. I.	P. & W.
<i>b</i> Allenstown	N. H.	Concord

To find the rate to Chesterville, Ill.: Reference number is 110: turn to page 8, as indicated in the foot note, and the rates are found to be \$3.72, etc. To find the different routes, etc., beyond Fitchburg Railroad to Nashua, N. H.: Reference numbers are 13, 14: turn to page 2, and the billing instructions are seen at a glance.

TECHNICAL.

Workmen Overcome by Gas in Hoosac Tunnel.

A dispatch from North Adams, Mass., Sept. 15, says: In the Hoosac Tunnel to-day, 69 workmen were overcome by coal gas from a passing locomotive. There were three gangs, 39 being masons repairing the brick arch, 22 in the electric light gang, and eight in the track gang. Freight train No. 31 went east about 9 a. m., and another train soon after went west, filling the tunnel with smoke. When second No. 31 came up the grade with a heavy freight, the engine had lost steam, so that when the train went into the tunnel the fire-box was filled with fresh coal. The masons, working about 1,000 ft. from the west portal, were affected but little, but in a short time the flagman toward the west shaft reported to Overseer McGrath that the trackmen in the 3,000-ft. section and electric light men in the 6,000-ft. section were overcome by gas. Passenger train No. 33 had just entered the tunnel from the west, and McGrath ordered it flagged. He then ordered all the men unaffected to rescue the track and electric light men; the rescuers found the men lying all along the track, some partially, and some wholly overcome. All were brought into the open air. Edward Dolan, one of the rescuing party, was so badly overcome by gas that all the afternoon he was in a precarious condition. The rescuers went clear to the 6,000 ft. working place and took out eighteen men, who were unconscious. Nearly all of them were on the east-bound track. Had the east bound express passed the masons' flag-man, the slaughter would have been terrible.

When the tunnel was finally cleared of men, rescuers and rescued alike were prostrated, some remaining in that condition all the afternoon. Two Frenchmen were believed to be dying; but all finally recovered. There are some days when the heavy atmosphere outside causes the tunnel to choke up with smoke, but there seems to have been a peculiar atmospheric condition in the tunnel to-day, as the air outside was clear and crisp, such as would ordinarily clear the tunnel quickly of smoke or gas.

Projected Railroads in Greece.

The United States Consular Agent at Piraeus reports: There is considerable talk about the construction of new railroad lines in Greece, few particulars of which may be of interest, especially to contractors. An extension of the Pirri-Peloponnes line from its completion at Patras to Pergos is being rapidly pushed on, and will be ready for traffic by the end of 1888. A line is projected from Mitons-Nauplia to Calamata, right across the Peloponnesus, 155½ miles long, with a gauge of 3 ft. 3½ in., to be built in accordance with plans and specifications drawn up by engineers of the French Mission to Greece, to be state property and worked under the immediate supervision of state officials. Another line is projected between Missolonghi and Agrinon, 27½ miles long, with a gauge of 3 ft. 3½ in. A Belgian firm has offered to build and equip the line for about \$750,000, the line, which is to be a state line, and more for military than commercial purposes, to be ready for traffic in 1890.

Pneumatic Train Signal.

The Georgia Pacific has adopted the Westinghouse pneumatic train signal and is putting it upon all the passenger equipment.

Combustion of Coal.*

The presence of combustible gases in the products of combustion is certainly a proof of the deficient utilization of coal. The defective methods used to collect the products of combustion have often led experimentalists to neglect the presence of combustible gases. M. Scheurer-Kestner thinks this a serious matter, and has taken care, when collecting these gases, to guard against sources of error. He finds the quantity of air most favorable to combustion, by beginning with a volume smaller than the theoretical quantity required and increasing it until it exceeded the maximum which could be well used. He determined that if from 8 to 9 cubic metres of air are employed for the combustion of 1 kilo of Rouchamp coal, carbon monoxide and perhaps pure hydrogen and carbureted hydrogen would be found among the gaseous products of combustion, and that from 6 to 18 per cent. of the carbon contained in the coal was lost; if from 10 to 12 cubic metres of air are allowed, the loss was only from 4 to 6 per cent.; with 12 cubic metres it is only 4 per cent.; while with 15 cubic metres it is reduced to 1 or 1½ per cent.

Practice, he stated, had already given useful data on this head; but the important fact to establish was the precise limit when the loss was the least, and the gain the greatest. He found that the furnace should be fed with a volume of air about 5 per cent. more than the theoretical quantity required for the combustion of the coal.

In regard to the question of smoke, the following experiment, he thought, could not be too much recommended to persons disposed to complain of factory chimneys. He remarked: "In the course of a boiler experiment, I placed beside the apparatus containing the gases of combustion a glass tube open at each end, into which I had introduced a layer of asbestos from 25 to 30 centimetres thick, in such a manner

that without exercising the least pressure, the gases were allowed to pass freely, and only the soot was retained. This tube was placed in communication with an aspirator, and the gases which entered were measured. The soot adhered to the asbestos, but only along a length of from 5 to 6 centimetres, the rest of it remaining perfectly clean. I was thus enabled to establish the proportion between the quantity of soot produced, and the quality of the coal consumed. But to any one who has not observed the fact, it is curious to note that however black and thick the smoke may be, even when purposely produced by feeding the furnace with insufficient air, it represents a loss of net more than 1½ per cent. of carbon in the coal; and if air be suffered to enter more freely, the loss resulting from the smoke falls to ½ per cent." M. Scheurer-Kestner, therefore, does not attach much importance to the generation of smoke so far as economy is concerned, and he only recognizes two really efficacious systems, one based upon the continuous mechanical feeding of the furnace and the other upon the combustion of smoke by mixing it thoroughly with very hot gases. In both cases the expense exceeds the economy effected by consuming the smoke. Of course there are frequent cases in which the necessity arises to have no smoke, and to employ apparatus to prevent its formation.

It may be useful to add the results obtained with a steam boiler of the French elephant type, with three tubes and a feed water heater. With the Rouchamp coal, taking the heat of combustion in the coal at 100 thermal units, the results were as follows:

	Per cent.
Thermal units in the steam were.....	63.5
" carried up the chimney.....	5.1
" in the combustible gases.....	4.9
" in the soot.....	3.7
" unaccounted for.....	22.8
	100.0

In more recent experiments 78.9 per cent. thermal units were obtained in the steam with coal "de la Ruche," and as much as 83 per cent. with a special Welsh coal sent by Mr. Donkin, of London. This loss, which ranges from 17 to 21.1 per cent. in the examples just given, is often more in practice, and must be attributed partly to the external radiation from the boiler, and partly to radiation from the brick work.

An Air Whistle for Switching.

The use of a whistle on passenger cars, to be sounded by means of air from the brake pipes, has been heretofore referred to in these columns. A local paper states that a device of this kind is in use on trains at the Union Depot, St. Louis, where the backing of empty trains into the building has to be performed with great care, owing to the number of people standing on the track and the noiselessness with which the cars move. The reporter graphically observes: "If as the cars roll down the track the trainman sees a passenger standing in the way he turns the valve, the air-brake is set, and the escaping air sounds a shrill blast on the whistle, which causes the affrighted passenger to throw his grip on one side of the track and himself on the other. The valve is closed, the brake released and the cars glide safely by."

The Thomson Angle Bar.

We published, on the 18th of last May, illustrations of a joint devised by Mr. M. W. Thomson, engineer of maintenance of way of the Pennsylvania Railroad. The joint, it will be remembered, consisted of two angle plates, embracing and passing under the foot of the rail, and was shown as applied to the Pennsylvania 75-lb. rail. A modification of the joint has been made, adapting it for the 85-lb. Pennsylvania section, and making a joint which will weigh about 96 lbs. per pair of plates. In the modified form the two lower bolts are left out. The modification, which will make the joint considerably cheaper, very likely will not impair its efficiency. The joint is designed for use suspended, and is 24 in. long.

A Reversible Signal Lantern.

In 1884 we illustrated and described the Burrell lantern, made by the Metzler Lantern Co., which has since then come into considerable use. The lantern has two globes of different colors. The handle passes through the centre of the lantern and is attached firmly to the lamp, forming an axis upon which the lantern may revolve. Only the upper half of the lantern is illuminated, the lower half being darkened by the body of the lamp. The handle catches to the rim of the half that is uppermost. Thus if a white or clear light is showing, and it is necessary that a signal of danger, or red light, be instantly given, a half revolution of the lantern gives the desired signal. Any further information can be obtained from T. William Harris & Co., the selling agents, No. 44 Broadway.

Adhesive Qualities of Onions.

Paper pasted, gummed or glued on metal, especially if it has a bright surface, usually comes off on the slightest provocation, leaving the adhesive material on the back of the paper, with a surface bright and slippery as ice. The cheaper description of clock dials are printed on paper and then stuck on zinc, but for years the difficulty was to get the paper and metal to adhere. It is, however, said to be now overcome by dipping the metal into a strong and hot solution of washing soda, afterward scrubbing perfectly dry with a clean rag. Onion juice is then applied to the surface of the metal, and the label pasted and fixed in the ordinary way. It is said to be almost impossible to separate paper and metal thus joined.—*Scientific American*.

The Age of Locomotives in Germany.

A German engineer, who has investigated the subject of the life of locomotives on the German roads, finds that at the end of the year 1886 there were in service 12,450 locomotives, and the average age was 12.49 years. These figures are taken from a list of locomotives put in service from 1845 to 1885: 59 engines which had been built before the year 1850 were still in use in 1886, and the oldest one in service was built in 1845. There were less than 100 still in service which were built in any one year before 1857, and there were 210 which had been in service in 1864, and 1478 which were added in 1885.

Canals in Europe.

There is much activity in canal enterprises all over Europe at present. Among other works of this sort on a very considerable scale may be mentioned several ship canals in England; that to Manchester is begun, while one between Birmingham and the Mersey is proposed. In Belgium an important canal is to connect Mons with the Charleroi and Brussels canals, and in Germany canals between the Oder and the Spree; between the Elbe and the Trave, and between the Elster and the Saale are proposed. The canalization of the Main for the largest class of Rhine boats up as far as Frankfurt has been recently completed, and that of the Moselle is talked of. It is on the above mentioned Belgium canal that there is being built the great flight of canal lifts, 3 of 56 ft. and 1 of 50, by which boats of 400 tons will be enabled with

great dispatch, probably in not over two hours and possibly in much less time, to overcome the 230 ft. difference of level between the Thirian Valley and the Hondeg branch of the Charleroi and Brussels canal.

Electric Street Railroads.

The Westinghouse Electric Light Co. controls the Tesla motor, and it is said will in six months be ready to supply motors for street railroads. It is the intention of the company to supply motors only, and not to undertake any other part of the building or equipment of street lines.

Rolling Stock for South America.

Philadelphia advises indicate an unusual demand from South America for locomotives and cars. The bark "Boyleton" will begin loading this week at that port with a full cargo of railroad material for Rio de Janeiro.

THE SCRAP HEAP.

Boot Legs.

The Western of Alabama has adopted a new standard of smoke stack for all of its engines, both freight and passenger, and is discarding the old ones as fast as the engines go into the shops. The style adopted is something similar to those now in use on the East Tennessee, Virginia & Georgia, commonly called "boot legs" by engineers because of their resemblance to the shape of a boot.

Japan as a Market.

Steel rail manufacturers, railway contractors and makers of railway material generally will do well to turn their attention to Japan. There is much to be done there in the way of constructing new lines, and in several districts new ventures are now on foot. The country is one that is rapidly developing, and offers a good field for British manufacturers. Our American and German rivals pay a good deal of attention to the requirements of the Japanese, but they are hardly likely to get hold of any of the above work, if our manufacturers keep their eyes open.—*Iron Trades Journal (London)*.

Rate Cutting Extraordinary.

A dispatch to the Kansas City Times, Sept. 12, says: Warrants were issued to-day in the United States District Court for R. McGee and Tom Ruggles, freight conductors on the Atchison, Topeka & Santa Fe running from Arkansas City to Purcell, I. T. The road claims to have learned that the two men were doing the passenger business from Purcell to Arkansas City. It was observed that when trains run by these two men reached Arkansas City they would have on board a large number of Indians and whites, while the passenger trains would have comparatively few. The regular fare between the two points is \$4.50, and on investigation it was learned that McGee and Ruggles had carried the people for \$2 each, and for the same amount in return. Hence the box cars were becoming more popular than the passenger trains.

On a certain occasion the two conductors engaged in a smart rivalry to get the passenger trade and cut rates on each other. Each had out agents soliciting trade, and in this way created considerable excitement. The last passengers rode from Purcell to Arkansas City for \$1. The two men had paper slips 1 x 2 in. for tickets, the McGee ticket having one hole punched in it for one trip, and the Ruggles two holes, and on the return the McGee ticket had five holes punched, and the Ruggles ticket seven. The McGee ticket was good on the Ruggles train, and vice versa. It is believed that they had been engaged in their crooked work for some months, and had secured several thousand dollars.

A Train Stopped to Witness a Duel.

CALLEGTSBURG, Ky., Sept. 17.—Two men, named Steele and Mackabee, both drunk, boarded an east-bound train at Mount Sterling yesterday afternoon and fought all the way to Steptoe, where the conductor, for the safety of those in his charge, put the men off and told them to fight it out. They drew their pistols and exchanged five shots each. The fifth shot from Steele's pistol passed through Mackabee's brain, killing him instantly. They were cousins. After the killing Steele boarded the train and proceeded home, the train having waited until the duel was over.

Standards of Length.

In a lecture delivered last February before the Franklin Institute on Standard Measures, by Mr. E. A. Gieseler, C.E., and which has since been reprinted by the author in a pamphlet, he states that the original units of length were found in the arm, the palm, the thumb, the foot, the step, etc., and from these various dimensions of the human body many of the still existing units have been derived. Mr. Gieseler reproduces from a book on surveying published in Germany 340 years ago a cut showing a method of getting a standard foot by taking the mean of the length of the feet of 16 men. Should Mr. Gieseler go hunting for water on the steppes of Kordofan and Darfour he would pretty surely be told that the depth of certain wells was three men and a cow's tail, or five men and an arm.

New York Passenger Traffic.

The New York Sun has recently collected some statistics of the passenger traffic in and about New York. It is found that 1,672 regular passenger trains leave the stations of New York, Brooklyn and Jersey City every 24 hours. This is exclusive of excursion and race trains. The Long Island road's summer service runs on its various lines 577 trains daily. The next largest business is done in the depot of the Erie in Jersey City, where 228 trains daily enter and leave, and there are 216 in and out of the Grand Central Depot, and 204 in and out of the Pennsylvania depot. Between 7,000 and 8,000 cars are employed daily in this traffic, and it is said that the number of people who entered and left the city by rail during the year ending May 1, 1888, was 40,188,000. Of this number the Long Island road carried about 8 millions, the Pennsylvania 6,367,000 and the passengers entering and leaving the Grand Central Depot in the same year were 8,881,000. It is said that the Long Island road carried 98,000 people to Coney Island on the 4th of July. The busiest moment in the evening is at 5:40 o'clock. At that instant 10 trains simultaneously leave the various stations. In the 15 minutes between 5:30 and 5:45, 50 trains in all go out. The busiest single hour is from 5 to 6 p. m. The busiest moment in the morning is 8:45 o'clock, when 9 trains enter the stations simultaneously.

The Last Word.

Talk has been completed on an extension of the — line at blank.—*Exchange*.

We have little confidence in the statement that there has ever been or will be an end to the talk about any railroad, but as a hopeful "straw" we print this cheerful item. We would gladly keep the phrase constantly set up if we could truthfully apply it to about 5,000 paper railroads.

* Abstract of a paper read by M. Scheurer-Kestner, before the Chemical Society of Paris.



Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN OPINIONS, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

A decided innovation is announced by the Union and Southern Pacific roads in the provision of what is virtually an additional class of sleeping cars for transcontinental passengers, as will be seen by the circular copied in another column. The plain sleeping cars, without upholstery, introduced on emigrant trains a few years ago of course proved a great boon to the poor emigrants whose tedious journey must have otherwise been little less than a species of torture, as experience had testified, but in addition to this they soon attracted travelers who had considerable means but yet felt unable to travel in a Pullman car. Ingenious passenger agents soon saw that the new cars could be made available for two quite distinct social classes, and they proceeded to carry out their idea. By engaging a car and by skillful solicitation of passengers they gave the advantages of a cheap berth to people who would not think of sharing quarters with ordinary emigrants, and for a small charge—\$5 per passenger—the passenger agent could furnish mattress and curtains and retain a snug commission for himself. However dirty a car may have been from a previous trip, a skillful application of soap and water would make it presentable, there being nothing but plain woodwork to deal with. Competition between the rival lines east of the Missouri has led to the reduction of the five-dollar fee, and from this and other causes the passenger has for some time been able to make a very comfortable journey from the Atlantic to the Pacific for less than \$70, including the expense of his lunch basket. But the necessity of taking people in car-load lots has restricted the advantages of this scheme, for persons who are at all particular about their surroundings, to excursion traffic, and the present move of the roads is evidently intended to remove this restriction. It is to be presumed that unfurnished cars—those in which the passenger must provide his own mattress, curtains and blankets—will still be run for those who do not wish to pay the \$2.50 additional charge, and submit themselves to the operation of the porter's blandishments to the extent of a dollar, more or less, in addition to that. Third-class or emigrant rates have, we believe, been abolished west of the Missouri River, so that there is nothing to separate cleanly people from the other kind, except the charge of \$2.50, aided, perhaps, by the tact of the passenger agent. But, even with imperfect conditions, this experiment is an interesting one, and, being made in the light of ample experience, will, no doubt, be closely watched. Sleeping car traffic, with all its wonderful advance hitherto, is still susceptible of extensive development, both as a luxury for the few and a convenience to the many.

Discrimination by means of car-load rates is put completely in the shade, so to speak, by the discrimination practiced by railroads between shippers who

will and those who won't assume the risk of breakage of fragile articles, etc. Articles which are charged 100 per cent higher at carrier's risk than when taken at owner's risk are familiar to all who ever examined a classification. A Pittsburgh dispatch states that Hostetter & Co., of that city, have complained to the Inter-state Commerce Commission on this point, charging that the Pennsylvania and numerous other roads demand a release from all claims for shortage or damage as a condition of carrying bitters in glass, boxed, at first-class rates. It will be well for the Commission to throw some light on this subject; for, although the evil is not a great one, it no doubt entails individual cases of hardship. If claims for damage were always settled with promptness and according to strict justice, few complaints would ever be heard, for the legitimate risk of breakage and other damage is so small that shippers of most goods can afford to assume it rather than pay anything additional to the carrier; but the placing upon shippers of the burden of proof in cases of damage which very likely occurred from causes the responsibility for which the carrier could not legally release himself from, introduces an element which renders any injustice in rates particularly onerous. If some bottles of bitters are broken by pure carelessness on the part of careless switch-train brakemen, the railroad should pay for them, whatever the agreement; but when the goods are billed O. R. the shipper must prove this carelessness or lose his claim.

The report of the Roadmasters' Committee on Labor on Track, which was put over to another year with out action, provided for a considerably greater number of section hands for track with broken stone ballast than for track ballasted with cinders or gravel. In the discussion it appeared that the labor of surfacing, tamping, clearing of grass and weeds, changing ties, etc., is greater with stone ballast than with gravel or cinders, but it would not seem that any of these things would need to be so often done with stone ballast. That is, although track may be more difficult to put in condition, it should not, one would suppose, require such frequent attention when ballasted with stone, and in the end the aggregate of labor put on it would be no greater. This point was not discussed. The question was asked why, if stone ballast requires more section labor, the railroads should go to the expense of putting it in. Of course, plenty of reasons were given. A chief engineer, whose lines extend over some eight degrees of longitude and four or five of latitude, and are subjected to a heavy and fast traffic, lately said that the cheapest track he has to maintain is that ballasted with sand. On account of the dust, however, he is compelled to cover the sand with a substantial coat of gravel. The dust, destructive to machinery and disagreeable to passengers, is in itself a sufficient reason why sand and cinders cannot be considered first rate ballast, notwithstanding the ease with which small irregularities of surface can be corrected where they are used. The ease with which they may be washed out unfit them for use in places liable to a quick and heavy flow of water, as on side-hills and grades. But as between gravel and broken stone the doctors disagree, and for the very good reason that neither one is better, under all conditions, than the other. Stone is more stable and less easily washed out, but gravel is more elastic; stone permits the water to flow away more quickly, but gravel is more easily handled; and so the advantages of one are offset by those of the other, and it is impossible to strike a balance between them that will hold ground anywhere. In fact, the choice will be governed by the relative cost of the material, the local conditions and special needs, and by the personal preferences of the engineer.

In another column a correspondent complains about poor brakemen, who take no interest in their business, and who retain their places through favoritism. How prevalent this form of favoritism is we have no means of knowing; but, of course, there is some of it. It is highly probable, however, that more incompetent men are put in the lower places in the service, and kept there, because of the superintendent's lack of information concerning their fitness than through favoritism. The aversion to presenting a complaint against a fellow-servant, which, as "Langdon" says, is common among conductors as well as other employés, is responsible for much poor service. Placing brakemen on an equality with conductors, so far as general allegiance to a common superior is concerned, probably tends to confirm this aversion. To have each conductor hire his own men is theoret-

ically correct. The reason it is not done is because superintendents believe, as they interpret their experience, that in practice it will not work. If all conductors were good disciplinarians, and could have as good opportunities to select capable men in all emergencies as are enjoyed by a superintendent, they could hire their own men; but the favoritism would not be got rid of, unless the conductors were less human than the average president, superintendent and train-master, and in fact the average man in any place. "Langdon" implies that he has to disobey the rules in order to get over the road, and that new men follow the book perhaps too closely. If this is the case we fear the aversion to report wrongs at headquarters is a sin of which "Langdon" himself is guilty. The practice ostensibly agrees with the rules. If it cannot be made to do so, trainmen should see that their superintendent knows the fact. "The way to secure the abolition of bad laws is to enforce them." This requires courage and a high degree of intelligence, and, moreover, a conductor would occasionally sacrifice his own immediate interests by boldly exposing differences between the precepts and the practice on his road; but the duty is incumbent upon him nevertheless. As regards brakemen taking charge of a train whenever opportunity offers, a wide-awake trainmaster will give his best brakemen chances to practice train-running as often as possible, merely for his own interest. It is to his advantage to have a large number of men at all times ready and qualified for promotion.

Wheat.

A year ago No. 2 red winter wheat was selling at 79 cents. To-day it is nearly 20 cents higher. If this advance were solely due to the efforts of speculators it might have little influence on railroad rates and railroad profits. But if it is due to the condition of the world's supply and demand, it becomes a most important factor in determining the prosperity of the railroads of the United States.

The difference between the price of a bushel of wheat at New York and the cost of raising it on the farm where it is produced, furnishes the sum from which railroad, middleman and farmer must all obtain their profits. If this difference is large, there is money for all concerned; if it is small, some, if not all, of the parties interested will have to be content with inadequate gains. In 1881, with wheat selling at good prices, there was enough money to pay a liberal dividend all around. With prices as they recently have been, some one must suffer. The railroads try to shove the loss upon the producers by keeping rates at a paying basis; the producers try to shift the loss upon the railroads by forced reductions in rates. Where there is not money enough in the business to pay all fixed charges, each tries to protect himself. The railroad tries to pay interest on its mortgages; the farmer tries to pay interest on his mortgages. Each, as is natural, cares comparatively little for the other's obligations to outside creditors.

So much of the conflict between railroads and shippers has been due to this cause, that any permanent rise in the price of wheat would be of great value as a means of preventing such trouble. Is the present rise likely to be at all permanent? To give an intelligent answer to this question, we must look carefully into the political economy of the subject.

In spite of variations between different countries, the price of wheat is made in the world's markets, and particularly in the markets of Western Europe. This is true for the United States as well as for other countries, for although we, of course, receive no wheat from Europe, we send varying quantities in different years, and the amount which we can advantageously dispose of there determines the quantity and price of what we retain at home. Wheat is an article whose price varies greatly with any change in the quantity. A slight excess diminishes it out of all proportion to its apparent importance; slight deficiency in quantity has an equally striking effect in raising the price.

If we had to consume our whole wheat crop at home, the changes of price from year to year would be enormous. In looking back over the history of wheat prices in years when the grain export trade was less considerable than it now is, we find precisely such fluctuations. The average New York price of northern wheat per bushel a quarter of a century ago varied as follows in successive years:

1850.....	\$1.27	1854.....	\$2.21
1851.....	1.07	1853.....	2.43
1852.....	1.10	1856.....	1.75
1853.....	1.39		

The extreme variation in this period ranged from a minimum of \$0.93 to a maximum of \$2.80—the latter being fully three times the former. Such violent movements are impossible to-day. If the American crop is

small, the higher prices cause a larger part of it to be retained at home. If it is large the low prices at home cause more to be exported.

But there is a limit to this equalizing process. Europe will take a great deal of our wheat; but not an unlimited amount. The European wheat harvest averages, ordinarily, somewhat under 12,000,000 bushels. Europe will readily take one hundred or one hundred and fifty million bushels of our wheat; in years of bad European harvest she will take a larger amount. But the moment the wants of immediate consumption are supplied, any additional shipments depress the price greatly. The seller is at a great disadvantage in this matter, on account of the active competition of other producers. The United States has to contend not merely with the wheat of Russia, but with that of India and other distant countries. The means of shipment of such wheat have been created for military and political purposes, and are ready to carry the wheat for mere operating expenses. If Russia had waited until her railroads would really pay commercially before building them, American producers would be free from much of the severe competition from which they now suffer.

The effect of these shipments and this competition from which they flow, was to depress very greatly the price of wheat in the world's markets, and to cut deeply into the profits of those who try to handle it. Some people have supposed that this depression was the result of an actual increase of supply in proportion to population, and that any recovery in price, such as we see to-day, could be only temporary. Others think that the extreme decline of two years ago was due to mercantile and financial causes; in other words, that the low price of wheat was an incident of the great commercial depression, more or less independent of the conditions of wheat supply.

As far as the facts can be ascertained, they seem to favor the latter view. We look in vain for any decisive evidence of over production of wheat, as compared with the number of mouths to eat it. True, the wheat crop of the United States has been increasing rapidly; but so have our exports and our population, and with the exception of the year 1884-85, which was in all respects an extraordinary one, there seems to have been no real increase in the ratio of wheat supply to population. In Europe the case is still clearer. The European wheat harvest, in a dozen years, has shown only a most trifling increase. Indeed so great are the variations from year to year that it is hard to be absolutely sure of any increase whatever. There have been increased importations from America and India, but a difference of 100,000,000 bushels in the imports to-day above those of a dozen years ago would be a full estimate. If the available wheat supply of Europe to-day, imports included, averages 1,400,000,000 bushels annually, it can hardly have been less than 1,250,000,000 or 1,275,000,000 in 1876, and may have been as high as 1,300,000,000. But the population of Europe has pretty certainly increased about 10 per cent. during these years. In that case, so far from any real over-production of wheat as compared with the needs of population, it has simply been maintained at about the same proportional figure.

Of course all these statistics are somewhat uncertain; but as far as they are worth anything, they go to show that the low price of wheat two years ago was due to commercial depression rather than to the fact that the supply had outrun the demand. If such was the case, there is reason to believe that the present recovery may be a permanent one. It is certainly not due solely to the efforts of speculators, nor to unfavorable crop reports from parts of the country. It is not confined to any one locality. It is felt in France as strongly as in the United States. It seems not unlikely that a somewhat deficient harvest in Europe may show people that the supposed overproduction did not really exist, and that the extreme fall in prices was due to a competition of sellers forced, by a variety of circumstances, to a somewhat unnatural

A return to the wheat prices of 1877 is, of course, out of the question. The improvements in production and transportation are such that wheat is not likely ever to touch \$1.50 in the New York market. But that it can maintain itself at a rate which shall leave the railroads more money in the business of transporting it than they have been able to get for some years past is certainly possible, and seems fairly probable.

Fast Freight Service.

A few Eastern merchants are considering among themselves the benefits which would accrue to them and to their customers should the railroads put on fast express trains for freight from New York to the West, and the question of a petition to the trunk lines

for such trains is under discussion. The extra expense to the railroads for such fast service is acknowledged, and an advance upon the present rates is a part of the plan. This is an instance of the fact that competition is slowly taking the form of better dispatched instead of lower rates. Such is the state of things to-day very largely in England, and readers will recall the incident mentioned in our columns where a tradesman in the north of England ordered his London shipments changed from one road to another on account of a delay of half an hour. The increasing value of dispatch is indirectly shown by the present plan of differentials, where there is a difference of five cents per 100 lbs. on dry goods. If now, say the merchants, our trunk lines would put on merchandise trains running at about the same speed as slow passenger trains, it would help the sale of goods from the seaboard to the interior. One drawback to the purchasing in the East of supplies of dry goods, hardware, etc., by the interior retailer has always been the time required before the ordered goods could reach the customer. It is human nature to wait till the last box or the last barrel has been opened before sitting down to order more, and thus the manufacturer or jobber near at hand has a great advantage. If delivery from New York could be made in Ohio say in 24 or 36 hours, the Eastern man would be put in a better position, and could afford to pay an advanced rate, for he could do directly more or less of the business now done through the Western jobber. Incidentally the project shows that the present rates of freight are not generally too high, for if so no more could be paid for any advantage, and this is a crumb of comfort in the multitude of daily complaints.

On the railroad side, the advantages of such a plan are not so clear ; at least, at any such advance as the merchants would be willing to pay. The railroads will undertake, for instance, to carry freight from New York to Chicago in $4\frac{1}{2}$ days ; but if consignees do not get their goods in less than seven days they probably are not surprised. By the shortest route to Chicago, $4\frac{1}{2}$ days gives, in round numbers, 203 miles a day, or, say, $8\frac{1}{2}$ miles an hour, including stops. If this speed is increased to 20 miles per hour, shipments from New York can be delivered in Chicago in two days. The cost to the railroads, however, of safely running freight trains at a speed which will average 20 miles per hour, including stops, will be considerable, and it is doubtful if they are yet ready to undertake it, even if the shippers are ready to pay for the better service. Stock trains are now run on various roads at this speed and faster, and a fast freight line was for several months running between New York and Chicago at a speed of about $14\frac{1}{2}$ miles per hour. This train was, however, discontinued, and it is questionable if a general merchandise service on a regular basis could now be profitably done at 20 miles per hour. The increased expense would not be only or chiefly in greater fuel consumption. It would begin with the rolling stock. To average 20 miles an hour a freight train would have to make long runs at 30 to 35 miles. This is constantly done for short distances, and sometimes for long distances; but to make a schedule such as is contemplated, freight cars must be fit to be run at this speed at all times and for any distance. To begin with, as the cars to be run in the fast trains will undoubtedly be heavy and heavily loaded, they will need a larger and longer journal, both for strength and to give enough bearing surface. To make the fast schedule there must be no delays from hot boxes, and few railroad officers would be willing to guarantee any freight car, with the journal and journal boxes in ordinary use, to go loaded to Chicago in two days.

The next step will be a better truck than the present diamond truck. Better springs, an efficient method of equalizing the weight on each wheel, and a longer wheel base will be required not only for the safety of the train running at high speeds, but for the sake of the track. In our record of accidents for last July there were 11 freight train accidents ascribed to broken axles, or other defects of the trucks. How many of the 33 "unexplained" accidents were due to like causes no one can tell. Better design and construction and more careful maintenance of brake gear will be required, and the cars must be provided with close couplers. Finally, and most important of all, a continuous automatic brake must be used. The air-brake is absolutely essential to the safe running of fast freight trains on roads where the general use of the block system and of distant signals is still in the future.

So far as rails and road-bed go, any of the main lines are ready for the innovation suggested; but there are other particulars in which very few of them are yet prepared for it, as our monthly record of accidents abundantly proves. Between facing point switches,

turn-outs, junctions and crossings not provided with interlocking, and the all but universal absence of block signals, it is hard enough to get the present traffic safely over the lines. With heavy freight trains, running at 25 to 35 miles an hour, the danger would be immensely increased.

No doubt such fast freight service as Eastern merchants are said to be seeking and to be willing to pay for could to-day be given, to a limited extent, by a few lines, by carefully selecting the rolling stock; but to put it on any larger commercial scale, and to give it regularly and safely, would require the extensive and costly improvements in cars and track that have been briefly indicated above, and it is very doubtful if freight in paying quantities could be got at reasonably increased rates.

There is, however, another side to the question. If rolling stock and track were in such condition that freight trains could generally run at slow passenger train speed, there would be great economies in operation, sufficient, perhaps, to more than counterbalance the increased expense coming from the sources that have been suggested. If all trains were run at uniform speed, and that the speed of the fastest trains, the maximum service could be got from any given piece of track. As the proportion of the trains running at uniform speed is increased, this condition of maximum efficiency will be more and more closely approached, and as the speed is increased the service that may be got out of one line of track also increases. It is only on few lines, however, that the track is worked to its fullest capacity, and therefore this possible economy is not yet so important as that which might come from getting more work out of the equipment, and making the work of employés give greater results.

The Location of Locomotive Works.

It is suggested that locomotive works might be profitably located in the South to supply the demand from the large mileage, some 38,000 miles, in that section. At least four locomotive works are, however, already situated in Virginia and Maryland. The Roanoke Machine Works, in the former state, are exceptionally well situated and are well equipped with new tools, Tweddell's hydraulic riveting plant in the boiler shop, Yale & Towne overhead traveling cranes in the erecting shop, and many other of the latest and most approved appliances for turning out a superior class of work cheaply and in large quantities. The Richmond Locomotive Works, formerly Tanner & Delaney, of Richmond, Va., are well known and have large and commodious shops. Messrs. Thomas W. Godwin & Co., of the Virginia Iron Works, at Norfolk, Va., have for many years annually turned out several locomotives, mostly narrow gauge, though the shops are principally occupied in the miscellaneous business of a seaport. The Mount Savage Works, at Cumberland, Md., have also not been exclusively occupied with locomotive work, and in fact the whole number of locomotives turned out by all four shops is about equal to the average annual output of any one of the principal locomotive works in the North. It is significant that no builders of main line locomotives are found west of Pittsburgh, though geared logging locomotives are built at Lima, O. The West may therefore with more reason than the South complain that its supply of locomotives must be drawn from a distance. Many of the large Western roads, especially the Chicago, Burlington & Quincy and Central Pacific, build many locomotives, but in all parts of the country, with only one or two possible exceptions, no railroad builds all the locomotives it requires. The reasons why locomotive builders prefer the East are doubtless the same that influence other manufacturers. A plentiful supply of raw material is a necessity which is only secondary to a good supply of skilled labor, and, as regards locomotives, both are found in the East. A builder of locomotives in Denver, Col., would find that it involved considerable waste of time to travel East to Ohio and Pennsylvania whenever he had to complain of the price, quality, or the terms of payment for tires, axles and plates, and, therefore, wisely remains at home near the source of supply. The same reasoning applies in all manufactures, and convenience and rapidity of communication between buyer and seller, as well as the question of price, must always influence the site of manufactories, whether of locomotives or of any other article in which both the workmanship and material must be the best procurable.

Another consideration possibly also has some influence. A manufacturer in the East is as favorably situated as his rivals for competing for orders in the South, West and Pacific Slope, and can of course look also for orders nearer home in the East itself. Let him,

however, move West, and though he may be more favorably situated to obtain orders in his immediate vicinity, he is practically shut out from obtaining Southern or Eastern orders. The great drawback to the business of building locomotives is the fact that the number of locomotives required varies enormously from year to year. Taking authentic figures in our possession, giving the annual output of all the principal locomotive building firms in this country and Canada, we find the output of one firm fell from over 200 locomotives one year to little over 40 two years afterwards. In another case the average output for two successive years was nearly four times that of the next two-year period. These fluctuations necessitate in busy times an increase of plant which must suffice to idle when orders are few and far between. This great fluctuation is mainly because most railroads build all the locomotives they need in dull times, and only give out orders for new engines when a rush of business keeps the shops fully employed on repairs. As long as this tendency prevails, the fluctuations in the locomotive building trade will represent, in an exaggerated form, the fluctuations in the general business of the country. In order, therefore, to be commercially successful a locomotive builder should not only aim to build a good locomotive with the least possible waste of time and material, but he should endeavor to secure a steady business, so that his plant and hands are always fully employed developing the best possible results, and not working overtime the whole of one year to be idle during nine months of the next. One method of securing a steady business is the ability to compete in different markets, so that if business is dull in one section, advantage may be taken of possible prosperity in another direction, while the maker confined to one market, must inevitably submit to its fluctuations.

Gas Fuel for Locomotives.

In another column will be found a letter from Mr. J. M. Goodwin on the use of gas fuel on locomotives. Our correspondent's suggestions relate to natural gas, whereas our criticism in a recent issue was drawn forth by a scheme to use gas made from coal, and therefore at about atmospheric pressure. The cost of compressing this gas would be considerable, and practically prohibit its use in the manner suggested.

In proposing to use natural gas on locomotives, our correspondent's comparison with coal is hardly fair. In the first place coaling does not necessarily involve "a special trip of the engine to a coal chute or bucket platform." A ride from Jersey City to Newark by the Pennsylvania will convince any one that locomotives can be coaled in a few seconds while standing on the main line. Very similar methods of coaling from an overhead pocket are used on the Manhattan and on many other roads. On the underground railroad in London, locomotives running the circle trains are coaled by hand with baskets while the train is making an ordinary station stop. In many cases, however, the few minutes consumed in coaling is of very slight importance, for where coal is economically burnt, it is quite possible for a locomotive to do a good day's work without re-coaling.

Our correspondent admits that the equivalent of an ordinary coal supply would require a natural gas tank 9 ft. diameter and 47 ft. long. As this tank would have to stand 200 lbs. pressure per sq. in., it would require to be made of plates at least $\frac{1}{4}$ in. thick, and would weigh about 50,000 lbs. In other words, the empty reservoir would weigh about 50 per cent. more than an ordinary tender empty, but complete with sills, trucks, wheels, tool-boxes, and last, not least, tank and coal space! If made flat, as suggested, the weight and cost of the reservoir would be materially increased.

An ordinary 3,000 gallon tender weighs about 73,400 lbs., when in working order, with full tank and 12,000 lbs. of coal. The tender, when empty, weighs about 36,400 lbs., of which the tank alone accounts for about 8,000 lbs. The trucks, sills, etc., therefore, weigh about 28,400 lbs. and, when the tender is loaded, serve to carry a weight of 45,000 lbs. in the shape of coal, water and the tank itself. The carrying part of the tender, therefore, weighs about 63 per cent. of the parts carried. If we assume that this proportion holds good in the far larger tender needed for natural gas, the weights come out as follows:

	Lbs.
Gas tank	50,000
Gas	3,860
Water tank, say	7,000
Water	25,000
Total	85,860
Add 63 per cent. for trucks, sills, etc.	54,092
	139,952

Nor is this the worst of the story. Taking the average weight of the tender when fuel and water are half consumed, the ordinary and the natural gas tenders compare as follows:

	Natural gas tender	Ordinary tender
One-half supply fuel	1,930	6,000
Fuel tank	50,000	50,000
Water tank	7,000	8,000
One half supply water	12,500	12,500
Trucks, etc., etc.	54,092	28,400
Total	125,522	54,900

In other words, when both tenders are fully loaded, the natural gas tender is nearly double the weight of the ordinary tender of the same capacity, the excess of weight being 66,600 lbs. When both tenders are half empty, approximately the average running condition, the difference in weight is over 70,000 lbs., and the ordinary tender weighs less than 44 per cent. of the natural gas tender.

Even if these immense differences in weight did not enhance the first cost and diminish the hauling power of a locomotive with a natural gas tender, the great increase in the length of the tender, necessitating an entire reconstruction of all round houses and turntables, would condemn the project.

The many useful and valuable properties of natural gas are self evident, but a little consideration will show that it is very unsuitable for use on locomotives running any considerable distance. It is possible that under special conditions compressed fuel gas could be stored to run a locomotive a short distance. The necessity of making the tank and connections absolutely tight would probably be a serious objection. The gas that escapes from the present natural gas pipes is a source of danger, but the loss is made up from the ever flowing wells, whereas a leakage from a reservoir containing only a limited supply would soon mean a stoppage on the road for lack of fuel.

A New Steel Rail Syndicate in Europe.

The *Colliery Guardian* (London) says that "The announcement of the proposed formation of a syndicate of steel rail makers of this country and the continent for the regulation of orders and prices is a matter of first importance. * * * Belgium, Germany and France are understood to have united with our own rail makers in a common effort to prevent the continuance of the unnaturally low prices which have long prevailed, and the new syndicate is promised an existence of five years." The *Guardian* views the impending establishment of this association, which is this time to include France, as an assurance that the depressed steel rail industry, and the deserving body of traders pertaining thereto, will experience the benefits which accrue from a steady advance in price, and a restoration of something like prosperity after a period of great depression. Iron, on the other hand, with the experiences of 1884 to 1886 still in its mind, wishes that its warning might be effective in stopping the proposed arrangement, and says "from 1884 to 1887 there was a falling off in the exports (of steel rails) from Belgium of about 25 per cent., and while those of Germany remained practically stationary, the exports from Great Britain increased very nearly 50 per cent."

The International Steel Rail Makers' Association, to which *Iron* refers, was formed in January, 1884, by the rail makers of England, Germany and Belgium; the French rail makers were regarded as a "negligible quantity" at the time, but during the existence of the Association they frequently made their presence felt uncomfortably. The result of the formation of the Association, as stated by the same authority, so far has been to raise the price of steel rails in England from £4 5s. to £4 15s., and in Belgium from 120 to 130 francs, while German manufacturers have been able to maintain the old quotations. The Belgian price did in fact rise from 112.50 francs to 130. In August, 1886, the same journal said: "Since the disruption of the International Steel Rail Makers' Association, by which prices had been maintained at an artificial, although comparatively low level, values have been falling rapidly, until now steel rails can be bought at 70s. per ton, delivered free on board on this side." And the *Guardian*, in the editorial quoted above, says: "The immense fall which occurred in rail prices upon the break-up of the last combination amongst the rail producers, and which has never been recovered, should now soon become a remembrance only of past history."

The following table gives the production of steel rails in the United States and Great Britain, and of finished steel in Germany, Belgium and France for the three years, 1884 to 1886:

	1884	1885	1886
United States	996,983	959,471	1,574,703
Great Britain	784,968	705,583	730,343
Germany	1,128,499	1,140,500	1,202,090
Belgium	183,916	155,012	137,771
France	336,400	364,058	348,299

The prices of English steel rails "at works," and given in Ryland's *Iron Trade Circular*, were for 1884, £4 15s. to £4 17s. 6d.; for 1885, £4 15s., and for 1886, £4 15s. to £3 12s. 6d.

In this country, on the contrary, the price of steel rails was January to April, 1884, both inclusive, \$34 per ton. The price then fell pretty steadily to \$26 per ton in April, 1885, the minimum price in this country, and then rose to \$36 in December, 1886, the average prices for the three years having been \$30.75, \$28.50, and \$34.50.

The break-up of the International Steel Rail Makers' As-

sociation was vaguely ascribed to internal differences and the advantages the French rail makers were receiving from an opportunity to compete without control from the association. The fact that in the years 1885 and 1886 the difference in the prices of American and English Bessemer steel rails were so small probably had a great deal to do with it. Sir Charles Tupper, in a speech delivered in the Dominion Parliament a year ago last spring, speaking of the Canadian Pacific Railway's order to this country for 10,000 tons of rails, said: "How do you suppose the combination between England, Germany and Belgium was broken up, under which we were paying \$5 a ton more for our rails? Strange as it may seem it was broken up by means of the United States. The Canadian Pacific broke it up by giving an order for steel rails to the United States instead of to that combination, teaching the people of England, Germany and France that we were not so prostrate as they supposed, not quite so helpless as they supposed; this led to breaking up the combination, because they became alarmed at the fact that in the United States, where rails were \$159 a ton only a few years ago, the price had been brought down to \$26." While Sir Charles, speaking in support of a government measure, may have given more weight to the effect of that order of the Canadian Pacific than it deserved, it probably was more effective in promoting differences within the association than the increased competition of the French rail makers.

There is nothing in the history of the International Steel Rail Makers' Association that should give the iron industry of this country any apprehension of the present syndicate, whatever may be the effect on our railroads. On the contrary, if it lives through its proposed span, we shall possibly become a steady competitor in the world's market. One of the prime factors in cheap production is commercial confidence in the sale of the product, and if the rail makers of the old world will kindly convince our rail makers that for the next five years they will throttle their production in the interest of a steady advance in price, our rail makers in return will perhaps show their European friends even greater improvements in the appliances for converting and handling steel than have marked any equal period in our history.

The race between England and Scotland has been discontinued for the present, though it is possible that it may be renewed next year. The West Coast route service has been re-arranged, the day express to Perth and the North of Scotland being accelerated, while the time to Edinburgh is increased to 8½ hours, the ordinary number of stops being resumed. As the speed is still 47 miles per hour, including stops, travelers have little cause to complain of slow service. During the race, the fastest time made on the London & Northwestern, between London and Crewe, 158 miles, without stop, was 2 hours 49 minutes, giving an average speed whilst in motion of 56.11 miles per hour. The highest speed attained in this run was 65 miles per hour, a very even pace being maintained throughout. Owing to the track tanks, a tender holding only 1,800 English gallons, or 2,160 American gallons, can be employed. The train is light, four 8-wheeled cars weighing about 45,000 lbs., and the engine weighs only 61,000 lbs. in working order.

One of these engines, "Watt," ran, without stopping, from Holyhead to Stafford, 131 miles, in 144 minutes, being at the rate of 54.5 miles per hour, hauling the special train which conveyed the Queen's messenger bearing the despatches containing the decision of the American Government in the case of the Trent difficulty in 1862. This was also accomplished by the aid of Ramsbottom's track tanks, and excited much attention at the time.

The Great Northern, apparently stimulated by these long runs, are, at last, contemplating also using track tanks, and running from London to York, 188½ miles, without a stop. At present one intermediate stop is made. It is somewhat singular that such a useful invention as the track tank should be used by only one English railroad for nearly 30 years after it had proved a success; reducing the weight and cost of tenders, saving the time spent in taking water, and enabling the best and cheapest water along the line to be used without a long line of pipe or an extra stop for water. In this instance, the alternative estimate for an ordinary tender called for 6,000 gallons capacity, involving an extra weight exceeding that of a heavy passenger car.

The present result of the race is that the time by both routes is now 8½ hours between London and Edinburgh, whereas it was formerly 9 hours by one route and 10 hours by the other. The future results will probably be the more general introduction of dining cars and a further acceleration of the speed of most English express trains.

The steamship "Great Eastern," which has passed through so many vicissitudes since her launch 30 years ago, has been beached near Liverpool with view to being broken up. It is stated that the iron hull is perfectly sound and that her structural strength is more than ample. Her engines, especially those driving the screw, are, however, very inefficient, and unable to propel her more than 5 or 6 knots per hour. The fine lines and good model of the "Great Eastern" would enable her to make long voyages at 20 knots per hour, if modern triple expansion engines were used. Her great depth and displacement make her singularly steady and easy in a sea that causes smaller vessels to roll and pitch violently, but the very features that make her steady militate against commercial success. Few bars can permit the passage of a vessel which can with advantage be loaded to draw 37 ft. 6 in. aft, and fewer decks can admit a vessel of 83 ft. beam and measuring 680 ft. on the water line. The greatest actual load displacement of the "Great Eastern" is stated at 39,000 gross tons, while the displacement of the next largest merchant vessel

afloat, the "City of New York," is 14,500 tons. The largest man of war afloat, the Italian iron clad "Lepanto," has a displacement of about 14,850 tons. This enormous disproportion of size explains the commercial failure of the "Great Eastern." Her enormous bulk was necessary to carry the slow moving, extravagant engines and bulky low pressure boilers of the time she was designed, 1853-54, but the innumerable improvements permitting the free use of steel and high pressure steam have enabled more powerful and economical engines to be made with less metal, while ships are now safely navigated without the double skin and other precautions which gave the "Great Eastern" a strength that is now considered unnecessary. A far smaller, and, therefore, less costly modern ship will now fulfill more than was expected of the "Great Eastern" by her designer and builder, Brunel and Scott Russell.

The "Great Eastern" has, moreover, always been an unlucky ship, and has brought trouble and loss on all who have ever had anything to do with her. Robert Stephenson, George Stephenson's only son, assisted at the unfortunate launch, took a chill, and died in a few weeks. Brunel, her designer, possibly the most brilliant and versatile engineer of his time, survived her launch, but died during her first voyage, which was marked by a fatal explosion. Her first captain, Harrison, was drowned by the upsetting of a rowboat. None of these mishaps had the slightest connection with the merits of her design, but like other accidents, had a very disastrous influence on her commercial success.

In the last issue of the *Railroad Gazette* appeared a report of the remarks of Mr. T. C. Clarke and others, in discussing the paper of Mr. F. E. Cooper, Resident Engineer of the Forth Bridge, at the Edinburgh meeting of the Iron and Steel Institute. In *The Engineer's* (London) report of the same discussion occur these words: "The discussion was of very small importance, turning on the use of the punch in America, instead of the drill, and an admission made by Mr. Clarke, an American engineer, that in the United States they made steel far too bad to put on a bridge, and that the Eiffel tower was to be of iron, because France could not make good steel. We commend these statements to the advocates of technical education."

Probably no one on this side of the Atlantic supposed that Mr. Clarke could have made such astonishing statements about American and French steels, and in fact no intimation that he did is to be found in any other report of the meeting that we have seen. On the other hand, Mr. Clarke addressed to *The Engineer* the following letter, which was published in that journal without comment:

SIR: Will you please insert my qualified denial of the statement, on page 155 of your issue of Aug. 24, that at the meeting of the Iron and Steel Institute I made the statement "that in the United States they made steel far too bad to put on a bridge, and that the Eiffel tower was to be of iron because France could not make good steel." Your reporter must have strangely misunderstood me, or else have mistaken some other person for me.

THOMAS C. CLARKE, Mem. Inst. C. E.

Aug. 27.

A large number of wash-outs were reported in Eastern Pennsylvania and Southeastern New York on Monday and Tuesday of this week. The Delaware division of the Erie was obstructed at five different points. The New York, Ontario & Western and New York, Susquehanna & Western suffered similarly, but traffic was delayed only one day. Dispatches from Newburg report land slides on both the West Shore and Erie. The Delaware, Lackawanna & Western and the Lehigh & Hudson River were inundated along the Delaware River. In all this region a great many highway bridges were swept away. On the Belvidere division of the Pennsylvania a passenger train was stopped by water on the track and had its rear car wrecked by a following freight train which ran into it, injuring three passengers. The Delaware & Hudson Canal was broken at half a dozen places. At Port Clinton a portion of the Port Jervis, Monticello & New York's roadbed slipped into the canal, pinning a loaded boat against the tow-path.

The Central of Georgia was considerably troubled by wash-outs last week. Several large trestles were carried away, and in one place 1,000 ft. of track was washed down an embankment. The Charleston & Savannah has been flooded this week, and the Chesapeake & Ohio was blocked a day by a washout near Orange, Va. Mexican dispatches state that the bridge over the Metlac Ravine, on the Mexican Railway between Vera Cruz and Mexico, will not be repaired for three or four weeks. The building of a temporary bridge is attended with great difficulty, and several workmen have been killed.

It is well known that compound and especially triple expansion marine engines give a more even pressure during the revolution on the crank shaft and other working parts, which can therefore be reduced in weight, the diminished strains rendering it safe to use less metal. The extent to which this economy of material may be carried with safety is indicated by the sizes given by Lloyd's Rules as sufficient for the main crank and propeller shaft of triple expansion engines working at 150 lbs. per sq. in. boiler pressure. The diameter for an engine having a low pressure cylinder 30 in. dia. and 24 in. stroke is 5% in. The largest compound locomotives yet built (Mr. Webb's main line express engines) have a low-pressure cylinder of exactly these dimensions, but the axle is 7 in. dia., and therefore has nearly 50 per cent. larger section. The strength against torsion being taken as the cube of the diameter, the locomotive axle would be 80 per cent. stronger. Such a com-

parison is not exact, but is, nevertheless, instructive. The crank shaft of a marine engine is not subject to the strains thrown on a locomotive axle by running over a rough road, but the rolling end straining of a ship in a heavy sea exerts a somewhat similar action, while the racing of a propeller is equivalent to the slipping of locomotive drivers.

The method of serving meals in the car instead of in dining halls at the stations is spreading in Europe, and in addition to dining cars on the American plan, hot and cold luncheons, etc., with wine, etc., are packed in baskets and can be eaten en route in compartment cars. While this plan may be convenient and save time on a comparatively short journey, the necessity for retaining the same position must be very tiring on a long journey. The luncheon basket system is to be introduced on the Indian mail train running direct from Calais to Brindisi. The 48-hour journey is expected to be reduced four hours by abolishing the stoppages at meal stations. In this case, however, the International Sleeping Car Co. run cars having a longitudinal alleyway, somewhat resembling that on the Mann cars here.

The Taku-Tientsin extension of the China Railway Company's line, 30 miles, was opened for traffic only this summer, and the trains are said to be crowded with native travellers. We have supposed that the opposition to railroads in China comes from the upper and official classes, rather than from the people. The popularity of the new line tends to confirm this theory. Last May there were a little less than 100 miles of railroad in China, including the Taku-Tientsin line, not then completed, but the company hoped to be able to extend the system slowly, with the expectation of getting to Pekin within a year or two. The line last built is laid with 70-lb. rail, Sandberg's standard section, and is evidently intelligently equipped and managed.

The widening of the Southeastern bridge across the Thames, at Charing Cross, London, has been completed, making the third railroad bridge across the Thames at London which has required widening, or being paralleled since originally built. Each of the widened bridges accommodates from eight to ten lines of rail.

There is a movement on foot among the mechanics in the Central Pacific shops, at Sacramento, Cal., to build a statue to the late Andrew J. Stevens, General Master Mechanic of the Central Pacific system.

The Pennsylvania contemplate building some new shops at Altoona, with a capacity of from 150 to 200 locomotives per annum. The plans are now being prepared, but are not yet nearly completed.

NEW PUBLICATIONS.

Rand, McNally & Co. announce that they will issue in November a new and enlarged edition of their admirable Business Atlas. The pages of the new edition will be twice as large as those of the old edition; that is, 15 x 21 in. instead of 10½ x 15 in. Maps which have heretofore appeared on double page insets will now occupy one page, while new double page maps have been engraved of some of the larger states and those in which population and railroads are increasing most rapidly. This atlas is very thoroughly indexed, not only for towns, counties and rivers, but also for railroads, by branches and divisions. The railroad systems are shown separately by distinct colors or symbols.

Krupp and De Bange. By E. Monthaye, Captain Belgian General Staff. Translated by O. E. Michaelis, Ph. D., Captain of Ordnance, U. S. A. Thomas Prosser & Son, New York.

This work is a comparison of the Krupp system of artillery with that of De Bange. Of course everybody is more or less familiar with the chief characteristics of the Krupp guns, which have been thoroughly tested in actual war by many nations. The system of Colonel De Bange has been adopted by France, but has not yet had the severe and extended tests that the Krupp guns have undergone. The monograph of Captain Monthaye compares the two systems, not only as to design and mechanism, but as to the material. The author is a strong partisan of the Krupp system, but he has given a good deal of information of interest and use, not only to students of ordnance, but to those interested in the manufacture of gun steel.

TRADE CATALOGUES.

Complete Catalogue, No. 6, Clayton Air Compressor Works. Dey street, New York.

This catalogue illustrates and describes in some detail various styles of the Clayton air compressors, duplex and single, actuated by steam, belt or gearing, for working rock drills, coal cutters, hoisting engines and water pumps in mines and tunnels, sinking caissons, elevating acids, transmitting natural gas, atomizing crude petroleum, supplying air to divers in submarine operations, etc., etc.

In addition it gives much reliable information and data of interest to users of compressed air, and descriptive tables and price lists of rock drills, hoisting engines, mining and boiler-feed pumps, pneumatic locomotives, boilers, blasting batteries, fuse exploders and complete mining and tunneling plants in general.

Machine Tools, Hill, Clark & Co., Oliver street, Boston, Mass.

This well bound and neatly arranged catalogue gives illustrations, descriptions and prices of a large number of iron

working machine tools made by various makers, chiefly in New England. The book will be useful to all buyers of machine tools, as it contains a very large and varied assortment of different styles and forms of machine tools for almost every purpose. Some idea may be formed of the scope of the catalogue when it is stated that some 50 different lathes are illustrated and described, and that in all nearly 200 machine tools are illustrated, besides chucks, screw plates, planer centres, taps, etc. The catalogue has a good index, and is altogether a very useful and comprehensive book of reference.

TECHNICAL.

Locomotive Building.

The 16 passenger locomotives which the Baldwin Locomotive Works, of Philadelphia, have been building for the Duluth, South Shore & Atlantic, have all been delivered to the road, and eight have been put in service. It is expected that the 15 freight locomotives which are being built at the same works will be completed by the end of October.

Car Notes.

The Boston & Albany has received from Osgood Bradley, of Worcester, Mass., a 65-ft. postal car.

The Mexican Railway has ordered a number of 25-ton steel freight cars in England.

The Jackson & Sharp Co., of Wilmington, Del., has completed the contract with the Philadelphia & Reading for 70 cars, and have just delivered the last of an order for 30 passenger cars to the Delaware, Lackawanna & Western road. The company is finishing a large contract with the Duluth, South Shore & Atlantic road, and have shipped five coaches to the Toledo, St. Louis & Kansas City.

The Southern Pacific has just given a new order for 1,000 25-ton freight cars. The increase in business is such that the scarcity of cars continues, notwithstanding the additions constantly arriving from the East.

The Kansas City & Southern has ordered 30 freight cars to be built at Dauphin, Pa.

The Pullman Palace Car Company is building 20 dining and sleeping cars for the Mexican National, to be used on the line between the City of Mexico and Laredo, which will be opened this month. The cars are finished in Mexican mahogany that has come all the way to Chicago to be manufactured and finished into fine forms, and returned as samples of American art and craftsmanship. The trade in Mexican mahogany is rapidly increasing, and the use of this wood is becoming quite common in fine office buildings and residences as well as in cabinet work.

The repair shop of the Housatonic, at Falls Village, Conn., have shut down for two weeks.

The Harlan & Hollingsworth Co., of Wilmington, Del., will soon deliver to John A. Morris, Westchester, N. Y., a car for carrying valuable racehorses.

Bridge Notes.

The Newport News & Mississippi Valley Co. has just finished a wrought iron viaduct at Big Clifty, Ky., 800 ft. long and 128 ft. high; one over Clark River and Island Creek, near Paducah; one across Tennessee River and one across Cumberland River. The road is also building an iron bridge across Salt River, with new piers, to cost \$160,000. This bridge is to be 396 ft. long.

The following bids for the new bridge between Holyoke and South Hadley Falls were opened by the joint board of Hampden and Hampshire County Commissioners. The contract was not awarded, as the figures submitted were considerably in excess of the appropriation, and the boards will probably call on the Legislature asking for an additional appropriation of \$50,000, the present appropriation being \$100,000. The specifications called for two different kinds of bridges, one of the pin and link style, and the other a truss bridge. The first figures being for the pin and link bridge, and the second the truss bridge:

Rochester Bridge Co., \$112,830, \$113,370; King Iron Co., of Cleveland, O., \$137,969, \$142,746; Keystone Bridge Co., \$117,000, \$131,300; Corcoran & Taylor Co., of Pennsylvania, first, \$122,200; Variety Iron Works, of Cleveland, O., first, \$163,000; Union Bridge Co., \$135,500, \$142,125; Passaic Rolling Co., of New Jersey, \$125,700, \$133,500; Berlin Bridge Co., \$150,000, \$153,000; an original plan, \$146,000; New Jersey Steel & Iron Works, \$137,274, \$143,154; Dean & Westbrook Co., first, \$150,000; Nelson & Buchanan, of Pittsburgh, \$142,660, \$141,000; Pennsylvania Bridge Co., of Beaver Falls, Pa., \$135,000, \$137,000; Hilton Construction Co., of New York, first, \$124,000; Wrought Iron Bridge Co., of Canton, O., first, \$110,500; Boston Bridge Co., \$157,750, \$158,200; Edgemont Iron Co., Delaware, \$114,500, \$126,000; Mt. Vernon Bridge Co., first, \$131,500; Rochester Bridge Co., \$112,830, \$113,370; R. F. Hawkins Iron Works, of Springfield, Mass., \$126,000, \$125,000; Dayton, O., Iron Co., first, \$137,000. The contract will not be awarded till the Legislature is appealed to for the extra \$50,000.

Manufacturing and Business.

The West End Street Railway Co., of Boston, has closed a contract with the Thomson-Houston Electric Co. for the equipment of a portion of that road with the Thomson-Houston motors. The construction of a line from Harvard square, Cambridge to Arlington, to be operated by the overhead head system, will be begun at once by the Thomson-Houston Co., and it is expected that cars will be in operation within sixty days. It was announced some time ago that this company had purchased all of the railroad patents belonging to the Van Depoele Electric Manufacturing Co., and had secured the services of Mr. Van Depoele. As a result of the enterprise with which the Thomson-Houston Co. is pushing the work of equipping street railroads, it has become necessary to further increase the manufacturing plant of the company, which will be done at once. In a recent issue we have given some account of the roads on which the company's system is operated or being put in service. The Commissioners of the District of Columbia granted a permit last month for the construction of an electric railroad to the Eckington & Soldiers' Home Railroad Co., and the portion of the road to be completed first will extend from Seventh street and New York avenue northwest, along New York avenue to Boundary street and thence to Eckington. The permit for the portion from Eckington to the Soldiers' Home has not yet been taken out. The Thomson-Houston system will be used here also.

The Chesapeake & Ohio has ordered a number of Hart-Wood switches.

The Southern Pacific has ordered for the station at Los Angeles, Cal., a combined arc and incandescent plant manufactured by the Waterhouse Electric & Mfg. Co., of Hartford, Conn.

E. D. Bolton, of the firm of T. William Harris & Co., 44 Broadway, New York, has been appointed consulting engineer, for Asheville, N. C., in connection with the new sewerage system, upon which it is proposed to expend \$100,000.

John C. Ashton, City Engineer, will be the resident engineer.

The Edison Electric Light Co., of New York, is putting up in Kansas City a station for incandescent lighting with a capacity of 30,000 lights. The cost of the plant will be about \$110,000.

The Putnam Machine Co. recently shipped a car load of machinery, consisting of one 24 x 24 in. planer, two 2 x 12 ft. engine lathes, one 2½ x 22 ft. engine lathe, and one No. 3 drill to Portland, Or.; one 5 x 20 ft. triple geared engine lathe to Kaukauna, Wis.; one 2 x 7 ft. planer, and one 2 x 10 ft. engine lathe to Dixfield, Me.

Iron and Steel.

The Penn rolling mill, of Lancaster, Pa., which has been shut down for four weeks, has again started up.

Proposals will be received until Oct. 8 for the purchase of the Lomas Forge & Bridge Works, of Cincinnati, O.

The Princeton Iron & Manufacturing Co. has been organized with a capital of \$15,000, with headquarters at Henderson, Ky.

The Hainsworth Steel Co. has been organized at Pittsburgh, Pa., with a capital stock of \$500,000, by William G. Johnston, John Irwin, Jr., Charles Bailey, Thomas C. Lazear, Stewart Johnston and William Lyon, who are at present connected with the Pittsburgh Steel Casting Co.

A company has been organized to build a blast furnace at Bremen, about 100 miles east of Birmingham, Ala. President Williamson, of the Chattanooga, Rome & Columbus road, is interested in the company.

The syndicate of creditors who bought the Pittsburgh plants of Graff, Bennett & Co. will blow in Clinton Furnace next week. They will soon afterward start the rolling mill on the South Side (Clinton), and they will also likely start the Millvale mill before winter sets in. The Grafton furnaces, at Leetonia, Ohio, formerly owned by Graff, Bennett & Co., have been leased by W. D. McKeefrey, of Sharon, Pa., and will be put in blast this week. The annual capacity of the two furnaces is 20,000 tons each.

The International Congress on Inland Navigation.

The third congress assembled on Aug. 20, at Frankfort-on-Main. The subjects discussed were: I. Inland navigation statistics. II. Improvement in the navigability of rivers. III. The best types of steam tugs on inland water-ways. IV. Economical condition of inland ship canals. V. Advantages accruing to agriculture by regulating rivers and making canals. VI. The rendering navigable and maintenance of estuaries.

The meeting, with 712 in attendance, divided into three sections for consideration of the subject, and their conclusions were afterwards presented to the whole congress.

The conclusion on the first subject was, that it is desirable to have an exact description of navigable water-ways, with cost of working, construction and maintenance, description of vessels and statistics of traffic. An "International Commission on Inland Navigation Statistics" was formed, the members of which were charged, if possible, to procure government recognition and to send all details possible connected with the subject to the Central Statistical Bureau at Berlin.

On the second question, it was resolved that the results so far obtained by the regulation and canalization of rivers have caused a notable increase of inland navigation traffic, and that there is a claim for further improvements, with a recommendation that hydrotechnical research as to the capacity of steamers be encouraged and continued.

There was a lack of unanimity in the report on the third question, which urged practical and scientific experiments under the direction of the governments interested, but it was adopted, as was also a resolution that the subject of tolls, dues and classification of freights be included in the programme of the next congress.

Engineer A. Gobert submitted the following as the conditions justifying the construction of ship canals to inland ports: "When the rates between the traffic expressed in tons and the cost of construction per kilometre expressed in francs is two to one, or greater, then there is utility in making a ship canal in the sense of its being a paying concern, because the cost price on the canal is so low that the resulting economy leaves a very large margin for indemnifying, at need, the parallel railways for eventual losses that the canal may cause them by diminishing the traffic." This was adopted as far as the general view, without indorsement of Mr. Gobert's figures.

Herr Hagen, of Berlin, reported in effect that in addition to the facilities of transport afforded to farmers and manufacturers, its regulation of a river is of the greatest advantage to the agriculturist, as it fixes the banks and diminishes the danger of blockades by ice.

The report on estuaries set forth the advantages of bringing vessels as far inland as possible, and the fact that the navigation of estuaries is more dependent on the rise and fall of tides than on the size of the river feeding into it. That rivers without marked tidal fluctuations can only be made navigable by narrowing the channel by jetties carried out to deep water, and in the case of those with high tides low training walls are recommended, on bold lines, without reduction of the impounding space for the waters of the flood tide.

This congress was under the patronage of the Emperor William II., and was opened by the Minister of State Von Böttichen. The next one, two years from now, is to be held at Manchester. For the above facts we are indebted to the *Journal of the Society of Arts*.

Six Months' British Railroad Accidents.

The summary of accidents and casualties which have been reported to the British Board of Trade as having occurred upon the railroads of the United Kingdom during the six months ended June 30 last, states that during the six months there were reported 17 collisions between passenger trains or parts of passenger trains, by which one passenger and one employee was killed, and 101 passengers and nine employees were injured; 22 collisions between passenger trains and freight or mineral trains, etc., by which one passenger and one employee were killed, and 117 passengers and 16 employees were injured; seven collisions between freight trains or parts of freight trains, by which eight employees were injured; one case of a train coming in contact with a projection from a train traveling on a parallel line, by which four passengers were injured; 14 cases of passenger trains or parts of passenger trains leaving the rails, by which two passengers and three employees were injured; three cases of trains or engines traveling in the wrong direction through switches, by which two passengers and four employees were injured; seven cases of trains running into stations or sidings at too high a speed, by which 16 passengers and one employee were injured; 56 cases of trains running over cattle or other obstructions on the line, by which two passengers and one employee were injured; seven failures of machinery, springs, etc., of engines, by which two passengers and two employees were injured; 150 failures of axles, by which one employee was injured; one failure of brake apparatus, by which four passengers were injured; four failures of couplings, by which one passenger was injured; one failure of a rope used in working an incline, by which one employee was injured, and 119 failures of rails, by which four passengers and four employees were injured.

Telpher Lines.

It has been a matter of wonder to us that greater extension has not been given to telpherage. The system devised by the late Fleeming Jenkin has been working at Glynde, in England, for about two years, but otherwise the invention seems to have been in a state of arrested development. Now, however, our English correspondent reports that two telpherage lines have been ordered for some tin and copper mines in Cornwall. We believe that in this country the opportunities for the profitable introduction of such a system are numerous, especially in the mining regions of the West, and we are glad to see that one of the motor companies proposes to devote its attention to this class of work.—*Electrical World*.

RAILROAD LAW—NOTES OF DECISIONS.

Powers, Liabilities and Regulation of Railroads.

An Arkansas statute pledges the state to issue bonds to every railroad company for every mile of road built on application to the Railroad Commissioners "for the loan of credit," and provides that the Legislature may tax said roads in an amount equal to the annual interest of such bonds, to continue until the bonds are paid, when the road shall be discharged from all state claims. But in case of failure to pay the tax, the treasurer, by sequestration, shall take possession of the revenues of the road until the debt is fully paid. The Supreme Court of the United States decided that neither the state nor bondholders are entitled to sequestration of the revenues in the hands of purchasers at a mortgagee's sale.¹

An act of Congress giving permission for the construction of a bridge across the Missouri River at Kansas City, provided that if the bridge was a draw-bridge it should be a pivot draw-bridge, with a draw over the main channel at an accessible and navigable point, and with spans not less than 160 ft. long in the clear on each side of the central pier, the piers to be parallel with the current of the river. The Supreme Court of the United States held that the 160 ft. between the piers should be obtained by measuring along a line between the piers drawn perpendicular to the faces of the piers and the current of the river, and that a bridge with spans of 160 ft., measuring along the line of the bridge between the piers, but measuring at right angles with the current only 153 ft. between the piers, is an unlawful bridge.²

The Supreme Court of the United States held that where a judgment creditor of a railroad applies, setting forth the precarious condition of the road and the necessity of a receiver, but does not sue out execution, because it would be useless, the Court may appoint a receiver; that the holders of over due bonds, secured by mortgage on the railroad, are not entitled to the net earnings of such road in the hands of said receiver when they have made no demand under their mortgage, even though the judgment creditor applied for a receiver subject to their rights.³

In New York the Supreme Court decide that a contract between two railroad companies by which the A company agreed to make good any deficiencies in the B company's net earnings so as to meet the interest on its bonded indebtedness, in consideration of which the B Co. should grant a first lien next to that of the bondholders on all its property and franchises, and also deposit with the A Co. a majority of its capital stock on condition that the right to vote on said stock should remain with representatives of the B Co. so long as the latter road was operated satisfactorily to the A Co., is not void as against public policy.⁴

In New York a resolution of a city council provided that a street car company should pay yearly "the annual license fees for each car now allowed by law." The only license fees at the time allowed by law were those provided by an ordinance requiring a license fee "for every accommodation coach or stage or stage coach drawn by two horses." The Supreme Court decide that horse cars drawn by two horses fall within these words.⁵

The Supreme Court of the United States declare that the Iowa code forbidding any common carrier to bring within the state for any person there from any other state or territory intoxicating liquors without first having been furnished with a certificate of the auditor of the county to which the liquor is to be transported, that the consignee is authorized to sell intoxicating liquors in such county, is void, because in conflict with the constitutional provision as to the regulation of inter-state commerce by the United States.⁶

The Postmaster-General, by an Act of Congress, is authorized to deduct from the pay of mail contractors for failing to perform their contracts. Where the trip is not performed, the price of the trip may be deducted in all cases, and not exceeding three times that where the failure is occasioned by the fault of the contractor or carrier. The Supreme Court of the United States decide that this provision is not repealed, as to railroads, by a later statute providing that the Postmaster-General shall for every failure of a railroad company to deliver mail on schedule time deduct not less than one-half the price of the trip, and where the trip is not performed, not less than the price of one trip, and not exceeding in either case the price of three trips.⁷

In Iowa the Federal Circuit Court hold that the duty imposed on railroads by the Iowa and the National statutes as to railroads, of receiving from connecting roads freight and passengers, is one which the Federal courts sitting in that state will enforce by mandatory injunction where the injury resulting from its non-performance is continuing; and it is no defense to such relief that a strike of locomotive engineers and firemen has been ordered on plaintiff's road, and that if defendant's road should accept cars from the "boy-cotted" road its own men would be called out.⁸

In Arkansas the Federal Court holds that where a statute authorizing a municipal corporation to contract "for the purpose of providing street railroads," and conferring, "for the time which may be agreed upon, the exclusive privilege of using the streets and alleys of such city for such purpose," it is the actual use of the streets for the purpose which confers the exclusive privilege, and the exclusive right to use the same attaches only when the use or its equivalent begins, and the city has no power under such a grant to devolve on any contractor the duties it owes to the public of determining when and on what streets the public convenience requires a line of road.⁹

In Michigan, pursuant to an agreement for purchase and reorganization, a railroad company, which was about to be foreclosed under a consolidated trust deed, conveyed to the trustee of the separate mortgage of its land grant all its equities therein, in trust to pay off all liens on the lands, and to turn in the balance to the trustees of the consolidated deed of trust. When the property was sold under this last trust, and bought in by the purchasing committee, these equities went with it. The land trustees paid off all liens except one of \$300,000, which was secured, in part, on other property, and from 1881 to 1885, both inclusive, had on hand four-fold security for that charge. The United States Circuit Court hold that, as between preferred stock and common stock, which latter under the charter was to be debarrased from participation until the former had been paid successive dividends of 7 per cent. during those five years, that the surplus, after providing for the security of the \$300,000 lien, was to be applied to dividends. The

same is true of premiums received by the company on first mortgage bonds issued and sold by it. As between such stockholders, a steel rail betterment should be charged to "construction account" and not to "operating expenses." The same is true as to money spent on steamers owned by the company to make them "more efficient;" and, where no "depreciation account" is kept, it is error to charge "expense account" with an estimated depreciation, when the money so charged was not actually spent upon repairs. Nor, under such circumstances, should money borrowed by the company and laid out in the purchase of new freight engines and coal cars be charged to operating expenses. There is nothing in the general railroad law of Michigan authorizing one railway corporation to acquire the stock and franchises of another completed company, with the intention of itself exercising such franchises; and, in the absence of such a statute, such an acquisition is unlawful.¹⁰

Carriage of Goods and Injuries to Property.

In Connecticut a railroad which had accepted goods for transportation to a point beyond its terminus, together with a deposit for the freight charged to destination, carried the goods to its terminus, and then, on the 23d of the month, which was Saturday, left the car containing them on a track used in common by it and a connecting carrier, and notified the connecting carrier thereof; and the latter, on the 25th, took the goods into its own depot, receiving at the time a bill of lading which, through mistake, bore no guaranty of freight, as required by agreement between it and the first carrier, and on the 26th notified the first carrier that it would not receive the goods for transportation unless the freight was paid or guaranteed by the first carrier; and such guaranty was given on the first of the next month, but on that day, before the guaranty was received, the goods were damaged by fire in the depot of the connecting carrier. The Supreme Court of Errors holds that the first carrier, and not the connecting carrier, was liable to the consignor.¹¹

In Texas the Supreme Court decide that a railroad is liable for delay in transporting cattle accepted by it for carriage, regardless of special contract made with the shipper limiting its liability to injuries resulting from willful negligence, and that whether an agreement between a railroad company accepting cattle for shipment beyond its line and the shipper, requiring the latter, as a condition precedent to his right, to recover for any loss or injury, to give notice to some officer of the company or its nearest station agent, before the removal of the cattle, is reasonable, and therefore binding on the shipper, depends upon whether the company had an officer or agent to whom notice could be given near the place of delivery.¹²

In Iowa the Supreme Court rule that in an action for the killing of stock, the negligence of plaintiff in driving them across the track without stopping to look or listen for an approaching train becomes immaterial, when the trainmen of the railroad failed to use ordinary care to avoid the accident after the danger was or should have been discovered.¹³

In Michigan the Supreme Court hold that in assessing damages for the taking of land for a railroad where the owner is using the property in a lucrative business in which the locality and surroundings have a bearing on its value, he is entitled not only to the money value of the property itself, but also to such compensation as will reimburse him for the interruption of his business and its damage by the changed condition of the locality.¹⁴

In Colorado the Supreme Court hold that the owner of land through which a railway Company has the right of way, actually used for railway purposes, cannot himself use such right of way or recover for trespasses committed thereon by others, the railway company being entitled to the exclusive use thereof.¹⁵

In Kentucky the Court of Appeals rule that in proceedings to condemn a person's home and place of business for a right of way for a railroad company, the jury may, in estimating the damages, take into consideration the inconvenience and loss resulting to the owner from being deprived of his home and established place of business.¹⁶

In Texas the Supreme Court hold that a railroad the owner of a lot on which green millet is growing, carelessly leaving its fence down, is not liable in an action to recover the value of a cow killed by eating the millet, where the Court finds as a fact that it is not generally injurious to stock.¹⁷

In Missouri the Supreme Court rule that where a passenger is negligently pulled off a railroad car by a brakeman, acting within the scope of his employment, the company is liable for all injuries occasioned thereby, though, owing to plaintiff's health, such injuries were more difficult to cure, and by reason of latent disease were more serious than they would have been to a person of robust health.¹⁸

A district court judge in Dakota, in charging the jury in a recent suit against a railroad in that state, gave them the following information: "When the track and machinery of a railroad are in perfect condition, and prudently operated, the trains will keep upon the track and run thereon with entire safety to those on the cars—the passengers on board. Whenever a car leaves the track and goes down an embankment, as this car did, it proves that either the track or machinery, or some portion thereof, is not in proper condition, or that the machinery is not properly operated, and presumptively proves that the defendant, whose duty it is to keep the track and machinery in proper condition and to operate it with necessary prudence and care, have in some manner violated their duty to the plaintiff." But the Supreme Court hold that this statement is erroneous because "it assumes as judicial knowledge what is at best only a disputable conclusion of fact; disputable certainly, unless we apply as the test of 'perfect condition' and 'prudent operation' the misleading but otherwise 'barren ideal' of pronouncing no track 'perfect' and no machinery 'prudently operated,' except after a passage safely made. Indeed, the very use of the word 'perfect' in this connection, and unexplained, is objectionable, as likely to cause the jury to think that the law exacts of railway corporations the duty of furnishing something better than a reasonably good track for the transportation of passengers—a track, say, ideally good."¹⁹

In Minnesota the Supreme Court hold that the duty of an engineer is not fully performed by merely bringing his train to a stop at a stopping-board before reaching a railway crossing. It is his duty to observe the track he is about to cross to ascertain whether there are any trains on it with which he would be liable to collide; and, even if he had the right of way, yet if he saw that a train upon the other road had passed its stopping-board without stopping, or was approaching it at such a rate of speed as to indicate that it would not stop, and hence that there would be danger of a collision in case he proceeded, he would not be justified in doing so, if he could stop his train before reaching the crossing.²⁰

In a case in the Federal Court in Illinois, the Court holds that an expressman and the engineer and conductor of a freight train are not "fellow servants;" the expressman having been killed in a collision caused by the latter's negligence. He left a widow, but no children or descendants of children. He was about 30 years old; had been earning \$5 a month; had been in defendant's employ several years; was temperate, industrious, living with and supporting his wife. He left no estate, and his widow was without means of support. The circuit judge allowed the widow \$4,000 damages.²²

In a Missouri case it appeared that the deceased was run over in the day-time while on defendant's track, within the limits of a city; that, at the place the accident occurred, there were two tracks, between which was a roadbed, and by the side of the track on which deceased was killed a dirt road used for a number of years by workmen employed near by; and that, owing to the roadbed being better and more level than the dirt road, the workmen and other pedestrians used the roadbed instead; that there was no evidence that deceased was killed at a crossing of any traveled road or street, or that any public crossing was within such a distance as to require the bell on the engine to be rung as required by statute; and that there was conflicting evidence as to whether either the bell or whistle was sounded. There was evidence of contributory negligence on the part of plaintiff. The Supreme Court held, that an instruction that if the jury believe the place where the injury occurred to deceased was a traveled public road or street, and had been used as a public road for 20 years prior thereto, then it was the duty of the servants of the defendant to keep ringing the engine-bell while the train was passing over said road or street, and for a distance of 80 rods before reaching the place of accident; and that, if it appeared that no bell was rung while passing said road or street at the time of and immediately before the accident, the jury might infer negligence on the part of the employees of defendant; and that deceased's death directly resulted from these omissions, they should return a verdict against the company—is erroneous, because it does not also put before the jury the question of the contributory negligence of the deceased.²³

In a Kentucky case the evidence showed that the plaintiff on a dark night attempted to cross defendant's track on a street in a village, that he lacked but one step of clearing the train when struck; that the train was running on a down grade, approaching a flag station; that before reaching the crossing the air brakes were released, increasing the speed of the train to 17 miles an hour; that the engineer could have seen plaintiff and slowed the train, but was not looking out, and did not see plaintiff until he was struck. The Court of Appeals held that the company is liable for the injury. But it was not guilty of "gross and willful negligence" under the statute giving punitive damages in such cases. The Court affirms a verdict for \$7,000.²⁴

In Texas the Supreme Court rule that where the evidence shows that deceased, on arriving at the railroad crossing, saw the train moving towards him at a distance of 40 paces, and, thinking he could drive across the track before it would reach him, whipped up his horses for that purpose, and was killed in the attempt, a clear case of culpable negligence on the part of the deceased is made out.²⁵

In Missouri the Federal Circuit Court holds that where a freight train breaks in two, and the engineer's signal of "down brakes" frightens plaintiff's team, which runs between the two sections, and is killed, but there is no evidence that the train broke by fault of defendant, or that there was negligence in discovering the break, or stopping the rear section, there is negligence on neither side, and no recovery can be had.²⁶

In Michigan a man was killed on a dark, rainy night, while passing over a railroad crossing in a city, and the evidence showed that 20 ft. from the track its view was unobstructed for a block, and that the locomotive had a blazing headlight, which lighted up the track for at least a block, and that deceased was well acquainted with the location. The Supreme Court rule that he was guilty of contributory negligence and the railroad is not liable.²⁷

In a similar case in Iowa the person injured attempted to cross the track in a one-horse wagon after dark. The engine with which he came in collision had a head-light brightly burning, in full view of him, when he reached a point 50 ft. from the crossing; from such point to the crossing he could have seen the head-light 350 ft. distant; he was driving a gentle horse, and there were no complicating circumstances to excuse his not seeing it. The Supreme Court reach the same conclusion as in the previous Michigan case.²⁸ In the Iowa case several witnesses on the engine at the time of the collision testified that as soon as the wagon was discovered in a place of danger the engine was reversed, the danger signal blown, and everything possible done to stop. On the other hand, a witness testified that the next morning after the injury the engineer in charge of the engine at the time of the accident stated that he saw the wagon on the track when he was about eighty yards distant from it; that it was April Fool day, and he thought the boys were fooling him; that when he got closer he saw a man in the wagon, and tried to stop, but was too close. The Supreme Court hold that such impeaching evidence did not warrant a finding that defendant could have averted the accident by exercise of due care after he discovered the wagon.²⁹

The rule that contributory negligence is not always a bar to a recovery is illustrated in a Wisconsin case, where the Supreme Court hold that where the plaintiff in attempting to board a moving street car fell, and was dragged some 160 ft. before the car stopped, he would be entitled to recover, even though guilty of negligence in attempting to get on a moving car, if the driver could have avoided the injury by the exercise of reasonable care in stopping the car, after he was notified that plaintiff had fallen, and was being dragged by the car.³⁰

In an Indiana case the Supreme Court rule that it is the duty of a railroad company whose tracks cross a highway in a populous town or city to maintain either gates or flagmen at such crossings; that a railroad which in operating the road with the company owning the same, under an agreement to pay the latter a specified sum yearly, in excess of the amount to which it is entitled out of the joint earnings, for the use of its tracks and the cost of switching, uses the tracks at such crossings where gates and gatemen are maintained, is bound to the same care in the use thereof as the company owning the road. If it accepts the services of the gatemen employed by the company owning the road, instead of employing gatemen of its own, they become, for the time being, its servants, for whose negligence it is responsible; and if it does not accept their services, its duty is to place competent gatemen at such crossings, and it is responsible for its omission to do so. This case is an interesting one, as laying down the duty of gatemen at such crossings and the rights of travelers. "It is," say the Court, "the business of the gatemen to watch the track, and, when clear, to open the gates for persons using the streets to cross; and, upon the approach of locomotives or trains, to close the gates and prevent persons and vehicles from crossing until the tracks are again clear. To persons in the street, who are approaching the railroad tracks with a view to crossing, an open gate is notice that the track is clear, and that it is safe to cross; but as the gates were liable to be closed at any time, persons crossing would naturally understand they should not linger on the track, but pass over

promptly and speedily. Therefore for a person to drive in a trot on to the railroad tracks while the gates are open, instead of being negligence, might be a high degree of care."³¹

¹ Tompkins v. L. K. & F. S. R. Co., 8 Sup. C., 762.
² H. & St. J. R. Co. v. Mo. River Packet Co., 8 Sup. C. Rep., 874.

³ Sage v. Memphis R. Co., 8 Sup. Ct. Rep., 887.
⁴ Bradford, E. & C. R. Co. v. N. Y., L. E. & W. R. Co., 1 N. Y. Supp., 263.

⁵ City v. Third Ave. R. Co., 1 N. Y. Supp., 397.

⁶ Bowman v. C. & N. W. R. Co., 8 Sup. C. Rep., 660.

⁷ C. M. & St. P. R. C. v. U. S., 8 Sup. Ct. Rep., 1,194.

⁸ C. E. & Q. R. Co. v. B. C. R. & N. R. C. Co., 34 Fed. Rep., 481.

⁹ Citzens' R. Co. v. Jones, 34 Fed. Rep., 579.

¹⁰ Mackintosh v. Flint & P. M. R. Co., 34 Fed. Rep., 582.

¹¹ Palmer v. C. & Q. R. Co., 6 New Eng. Rep., 470.

¹² Mo. Pac. R. Co. v. Cornwall, 8 S. W. Rep., 312.

¹³ Wooster v. C. M. & St. P. R. Co., 38 N. W. Rep., 425.

¹⁴ Grand Rapids & I. R. Co. v. Weiden, 31 N. W. Rep., 294.

¹⁵ St. Ong v. Day, 18 Pac. Rep., 278.

¹⁶ Covington S. R. T. R. Co. v. Piel, 8 S. W. Rep., 449.

¹⁷ Fennell v. S. S. R. Co., 8 S. W. Rep., 486.

¹⁸ Bates v. Old Colony R. Co., 6 New Eng. Rep., 583.

¹⁹ Owens v. K. C. St. J. & C. R. Co., 8 S. W. Rep., 350.

²⁰ Patten v. C. M. & St. P. R. Co., 38 N. W. Rep., 435.

²¹ Pratt v. C. M. & St. P. R. Co., 38 N. W. Rep., 356.

²² Ballow v. Wab. St. L. & P. R. Co., 34 Fed. Rep., 616.

²³ Guenther v. St. L. I. M. & S. R. Co., 8 S. W. Rep., 371.

²⁴ L. & N. R. Co. v. Roberts, 8 S. W. Rep., 459.

²⁵ Int. & G. N. R. Co. v. Kuehn, 8 S. W. Rep., 484.

²⁶ Buster v. Humphreys, 34 Fed. Rep., 507.

²⁷ Knotowski v. C. & G. T. R. Co., 38 N. W. Rep., 463.

²⁸ Bloomfield v. B. & W. R. Co., 38 N. W. Rep., 431.

²⁹ Id.

³⁰ Woodward v. W. S. R. Co., 38 N. W. Rep., 347.

³¹ C. C. & I. R. Co. v. Schneider, 14 West. Rep., 538.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Evanse & Terre Haute, 1½ per cent., quarterly, payable Oct. 15.

Lehigh Valley, 1½ per cent., quarterly, payable Oct. 15.

Missouri Pacific, 1 per cent., quarterly, payable Oct. 15.

Pittsburgh, Youngstown & Ashtabula, 3½ per cent. on the preferred stock, payable Sept. 25.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Alabama Midland, special meeting, Montgomery, Ala., Oct. 13, also Bainbridge, Oct. 18.

Cincinnati, Jackson & Mackinaw, annual meeting, Van Wert, Ohio, Oct. 3.

Cumberland Valley, annual meeting, Harrisburg, Pa., Oct. 1.

Dubuque & Sioux City, special meeting at Dubuque, Oct. 3, to amend the articles of incorporation and the by-laws; also to act on the purchase of the Cedar Rapids & Chicago, the Iowa Falls & Sioux City and the Cherokee & Dakota.

East Tennessee, Virginia & Georgia, special meeting, Knoxville, Tenn., Oct. 18.

Ithaca, Auburn & Western, annual meeting, 111 William street, New York City, Oct. 1.

Lake Erie & Western, annual meeting, Bloomington, Ill., Oct. 3.

Lakeside & Marblehead, annual meeting, Sept. 26, in the office of the Cleveland & Canton, at Cleveland, O.

Louisville & Nashville, annual meeting, Louisville, Ky., Oct. 2.

Lake Erie & Western, annual meeting, Oct. 3.

Minneapolis & St. Louis, annual meeting, Minneapolis, Minn., Oct. 3.

New York & Northern, annual meeting, 96 Broadway, New York, Oct. 15.

Ohio & Mississippi, annual meeting, Union Depot, Cincinnati, O., Oct. 11.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The American Society of Mechanical Engineers will hold its eighteenth convention and ninth annual meeting in Scranton, Pa., beginning Monday evening, Oct. 15.

The American Institute of Mining Engineers will hold its fifty-second meeting at Buffalo, N. Y., beginning on Tuesday evening, Oct. 2, 1888.

The American Association of Railway Chemists will hold its next meeting in Baltimore, Md., in October.

The New England Railroad Club meets at its rooms in the Boston & Albany passenger station, Boston, on the second Wednesday of each month.

The New York Railroad Club meets at its rooms, 113 Liberty street, New York City, on the third Thursday of each month.

The Central Railway Club meets at the Tift House, Buffalo, the fourth Wednesday of January, March, May, August and October.

The American Society of Civil Engineers holds its regular meetings on the first and third Wednesday in each month, at the House of the Society, 127 East Twenty-third street, New York.

The Boston Society of Civil Engineers holds its regular meetings at its rooms in the Boston & Albany station, Boston, at 7:30 p. m. on the third Wednesday of each month.

The Western Society of Engineers holds its regular meetings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m., on the first Tuesday of each month.

The Engineers' Club of Philadelphia will hold its next meeting at the house of the Club, 1,122 Gerard street, Philadelphia, Oct. 6.

The Engineers' Society of Western Pennsylvania holds regular meetings on the third Tuesday of each month, at Pittsburgh.

Engineers' Club of Kansas City.

The following is the programme for the fall of 1888: Sept. 3, Flood Waves of the Missouri River, by J. F. Wallace; Cable Railways, by Clift Wise, Oct. 1. The Complete Sewerage of Kansas City, by A. J. Mason, Nov. 5, Electric Railways, by T. F. Wynne. Discussions on the above papers are invited.

The Western Society of Engineers.

The 250th meeting was held Sept. 5. Mr. Henry S. Madock was elected a member.

Mr. Rossiter called attention to the desirability of a translucent profile paper, suitable for blue printing, and thought that great improvement could be made in the standard papers used by engineers so as to adapt them to such use. The question was discussed to some length, and the general utility of other scales than those furnished was suggested. The following committee was appointed to consider and report: Messrs. Rossiter, Williams and Parkhurst.

The Secretary read a paper by Mr. Geo. Y. Wisner, upon

"Levels of the Lakes as Affected by the Proposed Lake Michigan and Mississippi Waterway," and a discussion by himself. The matter was discussed by Messrs. Williams, Artingstall, Weston and others. The paper was laid over until next meeting for further discussion, and the Secretary was instructed to send out copies to members and others who wished to discuss the subject.

Switchmen.

The convention of the Switchmen's Mutual Aid Association was held at St. Louis this week. Tuesday's session was devoted to a revision of the constitution.

Firemen.

The Brotherhood of Locomotive Firemen at Atlanta on Tuesday took formal action indorsing federation with the engineers and switchmen. The report states that the Brotherhood voted an assessment of \$5 per month per man for the benefit of the Burlington strikers.

PERSONAL.

Mr. C. R. Fitch has resigned his position as Assistant Superintendent of the Long Island, and has been appointed Superintendent of the Mahoning Division of the New York, Pennsylvania & Ohio.

Col. J. J. Carter, President and General Manager of the Bradford, Bordell & Kinzua, tendered his resignation Sept. 11, but was prevailed upon to remain until Jan. 1. Col. Carter's private business interests demand his entire attention.

Col. T. M. R. Talcott, Commissioner of the Southern Railway & Steamship Association, has resigned that place to become First Vice-President of the Richmond & Danville. Col. Talcott served this road for 14 years (1869-83) before going to the Mobile & Ohio. He has been commissioner less than a year.

Mr. John Price Wetherill died at Germantown, Pa., Sept. 17, at the age of 64. Mr. Wetherill had been for 10 years a director of the Pennsylvania Railroad, and was not only prominent in Philadelphia as a business man, but as an active and useful member of many charitable and public organizations.

E. B. Thomas, Second Vice-President of the New York, Lake Erie & Western, now located at Cleveland, O., and in charge of the New York, Pennsylvania & Ohio, is to remove his headquarters to New York City, and assume the general management of the whole Erie system, relieving First Vice-President S. M. Felton, Jr., who has acted as General Manager since the resignation of Mr. R. H. Soule last spring. Mr. A. M. Tucker has been appointed General Superintendent of the New York, Pennsylvania & Ohio, as will be seen by the announcement in another column.

ELECTIONS AND APPOINTMENTS.

Alabama Midland.—Arthur Pow, formerly Chief Engineer of the Savannah & Western, has been appointed to that position on this road.

Albany & Susquehanna.—At the annual election at Albany this week the following directors were elected: Robert M. Oliphant, of New York; C. F. Young, of Honesdale, Pa.; Minard Harder, of Cobleskill; William L. M. Phelps, of Albany; James Roosevelt, of Hyde Park; Henry M. Olmstead, of Morristown, N. J.; James R. Taylor and David Dow, of New York; George J. Wilber, of Oneonta; Alfred Van Santvoord and B. H. Bristow, of New York, and Horace G. Young, of Albany.

Big Creek Gap.—The incorporators of this Tennessee company are J. Stoddard Johnston, George F. Berry, William E. Bradley, B. R. Hutchcroft, and John Jennings, of Campbell County, Tenn.

California Central.—J. T. Wedon has been appointed Trainmaster, with headquarters at San Bernardino, in place of S. M. Allen resigned.

Carolina, Greenville & Northern.—The directors are A. S. Johnson, J. M. Brabson, W. A. Allen, H. R. Brown, G. Reeves, A. U. Shoun, J. C. Parks, B. M. Robinson, and E. S. Brodix, of Greenville, Tenn. The officers are A. S. Johnson, President; J. M. Brabson, Vice-President; H. R. Brown, Secretary, and W. A. Allen, Treasurer.

Chattanooga, Cleveland & Murphy.—The incorporators are John A. Hart, M. H. Cliff, S. W. Divine, E. Watkins, and W. G. McAdoo, of Chattanooga, Tenn.

Chicago & Atlantic.—W. O. Johnson has been appointed Assistant to the President.

Cleveland, Columbus, Cincinnati & Indianapolis.—J. L. Van Winkle, Division Freight Agent at Indianapolis, has been appointed Superintendent of the Indianapolis & St. Louis, with headquarters at St. Louis, in place of T. W. Burrows, resigned. W. R. Hill has been appointed to the place vacated by Mr. Van Winkle.

Covington & Macon.—The officers of this road are: President, Douglass Green, New York City; Superintendent, A. J. McEvoy; Passenger and Freight Agent, A. C. Palmer; Chief Engineer, Woods Roberts. General office, Macon, Ga.

Los Angeles & Pacific.—The following have been elected directors of the consolidated company: Cornelius Cole, Everett E. Hall, Richard C. Shaw, E. C. Burlingame, Samuel W. Luitweiler, James M. Hall and W. T. Spilman.

Louisville, Evansville & St. Louis.—William Kerr has been appointed Traveling Passenger Agent, with headquarters at Knoxville, Tenn.

Louisville, St. Louis & Texas.—D. C. Hitchcock has been made roadmaster.

Master Car & Locomotive Painters' Association.—At the meeting in Cleveland, Sept. 13, the following officers were elected: President, Samuel Brown, Old Colony, Boston; Vice-Presidents, W. T. Hogan, Atchison, Topeka & Santa Fe, Topeka; Wm. Lewis, Grand Trunk, London, Ont.; Secretary and Treasurer, Robert McKeon, New York, Pennsylvania & Ohio, Kent, O.

Minneapolis, St. Paul & Sault Ste. Marie.—At the annual meeting held in Minneapolis, Sept. 18, the stockholders elected a board of directors composed of Minneapolis men, and, with two exceptions, the same that were on the board last year. W. D. Washburn was re-elected President of the board, and Thomas Lowery was elected Vice-President.

Nashville, Chattanooga & St. Louis.—At the annual meeting in Nashville, Tenn., Sept. 13, the following directors were elected: J. W. Thomas, G. M. Fogg, W. M. Duncan, H. A. Robinson, G. A. Washington, L. H. Lanier, Jr., M. Burns, Thomas Lipscombe, E. T. Jordan, T. W. Evans, J. W. Sparks, J. H. Inman, J. G. Aydelotte and J. D. Probst. The directors re-elected the present officers.

New York, Lake Erie & Western.—J. W. Ferguson has been appointed Assistant Engineer, with office at 187 West street, New York, in place of A. E. Aeby, transferred.

New York, Pennsylvania & Ohio.—A. M. Tucker has been appointed General Superintendent, with office at Cleveland, O. C. R. Fitch has been appointed Superintendent of the Mahoning Division, with office at Youngstown, O., to succeed A. M. Tucker.

Norfolk Southern.—The following appointments have been made: W. W. King, to be Secretary to the General Manager; H. H. S. Handy, to be Train Master and Road Master, with office at Berkley, Va.

Oregon Railway & Navigation Co.—Mr. J. Evans has been appointed Master Mechanic, with headquarters at Dallas, Or., vice Mr. H. N. Webber, resigned.

Paducah & Hickman.—The incorporators have elected the following directors: C. T. Randle, Hickman, Ky.; E. O. Reid, Clinton, Ky.; R. S. Murrell, Hickman, Ky.; J. M. Ringo, Clinton, Ky.; Edward Farley, Charles Reed, and Henry M. Houston, Paducah, Ky. The officers are C. L. Randle, President; E. Farley, Vice-President; E. O. Reid, Treasurer; H. Mulholland, Jr., Secretary; W. G. Bullitt, Attorney. Executive Committee, C. L. Randle, E. Farley, and H. M. Houston.

Philadelphia & Atlantic City.—W. G. Johnson has been appointed Engineer. His jurisdiction includes the Williamsburg & Delaware River and the Camden, Gloucester & Mt. Ephraim, also.

Port Townsend & Southern.—The following are the officers of this company: J. A. Kuhn, President; R. C. Hill, Secretary; W. Landes, Treasurer, and R. E. Andrews, Chief Engineer. The general offices are at Port Townsend, Wash. Ter.

Richmond & Danville.—Col. T. M. R. Talcott has been elected First Vice-President.

St. Paul, Black Hills & Pacific.—The following are the officers of the company: L. G. Johnson, President, Aberdeen, Dak.; W. C. Houghton, Secretary, Aberdeen, Dak.; Hiram R. Lyon, Treasurer, Mandan, Dak.; W. L. Richards, Chief Engineer, Mandan, Dak.; E. C. Rice, Counsel, Mandan, Dak.

Toledo, Saginaw & Mackinaw.—M. B. Wilkinson has been appointed Superintendent, with office in East Saginaw, Mich. P. F. Gaines has been appointed General Agent and will have charge of the passenger and freight business.

OLD AND NEW ROADS.

New Companies Organized.—Big Creek Gap.—Bridge Junction, Carolina, Greenville & Northern.—Fairmount Valley.—Los Angeles & Pacific.

Big Creek Gap.—The charter of this proposed East Tennessee road has been filed in Tennessee. The company has been organized for the purpose of constructing a road from Caryville, on the East Tennessee, Virginia & Georgia, in Campbell County, to Cumberland Gap, in the county of Claiborne, upon the most practical route. The distance will be about 35 miles. It is thought the work will be shortly commenced. The offices are at Careyville, Campbell County, Tenn.

Camden & Atlantic.—The directors have authorized the issue of \$125,000 general consolidated mortgage 5 per cent. bonds, to retire bonds and mortgages on real estate and to take up the floating debt. The new bonds will mature in 1911. There have already been \$350,000 bonds of this issue which bear six per cent. interest. They are quoted in the market at 110, and the new 5s are expected to sell to fixed charges will be effected by the funding operation.

Cape Fear & Yadkin Valley.—The grading on the branch from Stokesdale to Madison, N. C., a distance of 12 miles, has now been finished.

Carolina, Greenville & Northern.—This company has been organized at Greenville, Green County, Tenn., to build a road from Paint Rock, N. C., a point on the North Carolina road near Hot Springs, to Big Stone Gap, in Wise County, Virginia, across Green County via Greenville and thence across the Holston Clinch and Powell's River valleys, a distance of about 153 miles. The road will connect with the Western North Carolina at the south terminus, cross the East Tennessee at Greenville and connect with the Clinch Valley extension of the Norfolk & Western and with the Louisville & Nashville at Big Stone Gap. The company is already negotiating with several construction companies, and surveyors are now going over the line, which was located under an old charter granted for a part of the route many years ago.

Chattanooga, Cleveland & Murphy.—The Secretary of State of Tennessee has granted the application for a charter for this company to construct a road from Chattanooga to a point on the boundary line between the states of Tennessee and North Carolina, but neither the distance nor the terminal at the eastern end of the line have been decided upon. This will be settled at an election of officers to be held Oct. 15, at Chattanooga.

Chesapeake & Nashville.—It is stated that Hon. John B. Thompson, of Harrodsburg, Ky., representing this corporation, has succeeded in securing a backing for this proposed Kentucky road, and that a company of Eastern capitalists will soon begin the work. G. F. Jackman has been made chief engineer, and his preliminary survey has already been made. The line is contemplated to run from Lexington, Ky., where it connects with the Chesapeake & Ohio, southward through the Bluegrass counties of Jessamine, Boyle, Mercer, and Marion; the timber counties of Marion, La Rue, Hart, and Barren, to Scottsville, in Allen County, the northern terminus of the road now in operation. The length of the proposed line is 140 miles.

Chicago, Burlington & Quincy.—On Saturday last the first Chicago, Burlington & Quincy train entered St. Louis over the Wabash Western tracks from St. Peters, under the arrangement recently entered into between the two companies. When the engines reached the yard, and were run on the turn-table at St. Louis to be placed in the roundhouse, the men employed to turn the engines refused to turn the table. The hostlers also refused to run them in the house. The Q engines were therefore run on sidings, and remained there all night. The wipers also refused to clean the engines, and they presented a dirty appearance the next morning. The engineers and firemen were refused entertainment by the boarding-houses in the neighborhood, and were compelled to go to a hotel.

General Manager Hays of the Wabash Western said to a reporter: I do not apprehend any serious trouble. It is true the hostlers refused to do the work, and they were relieved. There are so few of them that we could put on new men every day if necessary, and I am not disposed to believe

Wabash Western employés would create trouble over such a trivial matter. We shall fulfill our contract with the Burlington to house its engines.

Chicago, Kansas & Nebraska.—It is now expected to have all the tracklaying on the Colorado extension completed by Oct. 15.

Chicago, Milwaukee & St. Paul.—Excitement has been caused in Wall street by the decision of the directors to pay no dividend on the common stock, and to reduce the usual 3½ per cent. semi-annual dividend on the preferred stock to 2½ per cent. The earnings of the road for the first half of this year are given as follows:

	1888.	1887.	Inc. or Dec.	P. c.
Gross earnings ...	\$10,554,089	\$11,113,471	D. \$639,382	5 8
Operating exps. ...	8,678,164	7,530,541	I. 1,147,622	15 2
Net earnings ...	\$1,875,925	\$3,662,930	D. \$1,787,005	48 7

The number of miles operated has increased about 8 per cent., the increase consisting of lines in thinly settled country, of course. The ruinous reductions in rates during the past six months are well known to our readers.

Vice-President Bond makes the following statement: With the dividend on the preferred stock of 2½ per cent. preferred stockholders will have received 6 per cent. during the current year, and common stockholders have received 2½ per cent., making a little more than \$2,300,000 paid out in dividends during the twelve months. The company has never earned during the first six months of the year the dividends usually declared in September. Last year but \$3,600,000 was earned during the first six months, and \$6,450,000 was earned during the last half of the year. It has always been a custom of the Board, when declaring the September dividend, to anticipate the net earnings during the last half of the year; but the severe losses arising from the demoralization in rates during the last twelve months, and the uncertainties concerning state legislation in the same direction, warrant a departure from the usual policy of anticipating net earnings in the declaration of dividends. It was therefore thought best to wait until the end of the year before deciding on the distribution of further net revenue for 1888. We are satisfied that we shall have the largest tonnage to move in the company's history, and that every car and every engine will be brought into use; but the unsettled condition of rates demands that the company should hold itself in a strong position financially. While the decrease in the net during the first six months is exceptionally large, it is but little in excess of that shown by the Chicago & Northwestern, and not nearly as large as that of the Atchison, the Burlington, and, it is believed also, the Rock Island. I refer to this only to show that the exceptional circumstances beyond the control of the company and its officers have worked quite as severely against all the other roads in the country tributary to our lines.

Chowan & Southern.—Harper, Bruce & Co., of Suffolk, Va., are the contractors for grading the road between Drivers, Va., and Tunis, N. C., 36 miles, and Roxobel and Tarborough, N. C., 27 miles. The contract for trestles and wooden bridges has been let to Ross & Sanford, of Baltimore. The contract for masonry has not yet been let out.

Colorado Midland.—It is expected to have the extension from Glenwood to Newcastle, Col., a distance of 15 miles, completed early in October.

Fairmount Valley.—Incorporated in Georgia to build a road from Cartersville to Coosawattee and to the Tennessee state line. The incorporators are C. H. Smith, H. M. Smith and G. H. Aubrey.

Georgia, Carolina & Northern.—The road has been completed to within about 12 miles of Chester, S. C. About 40 miles of the line are in operation. The heavy rains have interfered with the construction.

Greenwich & New Granville.—Surveys are in progress for this proposed line from Greenwich, N. Y., north by east, to Rutland, Vermont.

High Point, Randleman, Asheboro & Southern.—The engineers are now in the field locating the line for this road, and the contracts for building the road will be let soon after the survey has been finished. Fourteen miles have already been graded. The Richmond & Danville is to provide funds for construction.

Kansas City, Wyandotte & Northwestern.—The locating survey for the extension of this road northwesterly from its present terminus will be continued to Beatrice, Neb. S. L. Davis, Seneca, Kan., is the contractor for building this extension and also for the 2½ mile extension in Leavenworth, Kan. The latter line is to be a part of the Leavenworth Rapid Transit "Dummy" Line, which is owned by this road.

Los Angeles & Pacific.—Articles of incorporation have been filed in California consolidating the Los Angeles Ostrich Farm, the Los Angeles County and the Los Angeles & Pacific railroads, under the name of the Los Angeles & Pacific.

Louisville, New Orleans & Texas.—This road, which has a branch from Lula, Miss., west 20 miles to Glendale, on the Mississippi River, opposite Helena, Ark., is preparing to establish terminal facilities in the last-named city, and will put on a transfer boat. Connecting tracks to the St. Louis, Iron Mountain & Southern and the Arkansas Midland stations in Helena will be laid in the streets.

Louisville, St. Louis & Texas.—This road will be opened for traffic Oct. 9, between Owensboro, in Daviess County, and Steubenville, in Breckinridge County, Ky., a distance of forty miles. The remainder of the line will be opened as completed.

Louisville Southern.—Chief Engineer John MacLeod Sept. 17 started a corps of surveyors on the final location of the extension of this road from Lawrenceburg, in Anderson County, to Lexington, in Fayette County, Ky., a distance of 24 miles, and construction work will begin one week later. It is thought that as this line, when finished, will shorten the distance between Lexington and Louisville more than 20 miles, the Chesapeake & Ohio will use it as a short line to and through Louisville.

Manistee & Northeastern.—Sixteen miles of track has now been laid from Manistee, Mich., to Onekama, a distance of 18 miles. The survey has been completed from Manistee to Long Lake, Grand Traverse County, Mich., 46 miles, which it is expected to complete this year. The road will probably be extended to Traverse City, about 75 miles from Manistee, next year.

Manitoba & Northern Pacific.—It is stated that a portion, probably 25 miles, of the proposed line from Morris westward to Brandon, 135 miles, is likely to be built this season.

Middletown & Hummelstown.—The capital stock of \$100,000 of this company has been subscribed. The survey for the road has already been made and right of way is now

being obtained, and as soon as this is done it is intended to commence the construction of the road, which is projected to extend from Middletown, Dauphin County, northward about five miles to Hummelstown, on the Pennsylvania, and will pass through valuable brownstone and limestone lands. John W. Rife, Middletown, Pa., is President.

Midway & Georgetown.—The grading on this Kentucky road was completed Sept. 10, and tracklaying begun. It is expected to have the road in operation by Oct. 15.

Missouri, Kansas & Texas.—A bill has been filed in the United States Circuit Court, at Topeka, Kan., by the Union Trust Co., of New York, against the Missouri, Kansas & Texas and the Mercantile Trust Co., asking foreclosure of the consolidated mortgages issued Feb. 1, 1871; June 1, 1872; Nov. 1, 1872, and June 1, 1873. These mortgages were given to secure bonds aggregating about \$18,000,000, and are first liens on over 800 miles of road. The Mercantile Co. is the trustee named in a second mortgage on the same property. The Missouri Pacific is made a co-defendant.

New Roads.—A line is being surveyed to extend to Mendham, N. J., from a point near Morristown on the Morris & Essex division of the Delaware, Lackawanna & Western. Some of the Delaware, Lackawanna & Western officials are interested in the enterprise.

A company has been organized at Bluffton, Ga., to build a railroad southwesterly about 12 miles to Blakely, where connection will be made with the Central of Georgia.

Oregon Railway & Navigation Co.—Argument was heard in New York this week in the order to show cause in the suit of Brayton Ives and others against the company why defendants should not be punished for violating an injunction restraining the construction of branch lines and bridges in Washington Territory and elsewhere, and also for withdrawing funds from the Farmers' Loan & Trust Co. President Elijah Smith admitted that he withdrew \$1,200,000 from the Trust Co. for the purpose of avoiding litigation and getting it out of the jurisdiction of the Court. The money was withdrawn before the order of the Court was granted, and was sent to Boston, but is still in the possession of the company to be used in building branch lines, which work is being done under contract. Judge Barrett decided that the Court had no right to restrain the continuance of the work on the branch lines under contract, but ordered a reference to get at the facts about the withdrawal of the funds.

Paducah & Cairo.—This line, from Paducah, Ky., to Cairo, Ill., 32 miles, has been definitely located by the New- port News & Mississippi Valley Company, and the road will soon be built under two charters granted by the Kentucky Legislature last winter. M. E. S. Posey, the engineer in charge, has submitted his plans and expects to begin the work of construction by Oct. 15.

Pennsylvania.—It is said that surveys are in progress for a road from the main line of the Pennsylvania at Mill- stone Junction eastward on the north side of the Raritan river to Woodbridge, and thence to the Arthur Kill.

Pennsylvania Company.—A preliminary survey has recently been made between Warren, Ohio, on the Pittsburgh, Youngstown & Ashtabula road, and Ravenna, on the Cleveland & Pittsburgh, about 40 miles. A line between these points would connect two important systems of the Pennsylvania and furnish a desirable connection between Youngstown and Cleveland, but we understand that there is no present intention of building, as has been reported.

Pennsylvania, Poughkeepsie & Boston.—It is said that it has been decided to make Campbell Hall, N. Y., the terminus of the line now being built from the west bank of the Hudson River at Poughkeepsie, instead of Montgomery, as at first intended. By building to Campbell Hall direct connection will be made with the New York, Ontario & Western, as well as with the New York, Lake Erie & Western and Walkill Valley roads. It is also stated that the Lehigh & Hudson River has agreed to build a line from Greycourt, the present termination of that road, to Campbell Hall.

Philadelphia & Reading.—Judges Allison and Biddle have refused to authorize the company to retain in the three mills state tax on Schuylkill Navigation bonds, for which judgment had been asked by Walter Hinchman against the company. The Court followed the decision of Judge Simonson, of Dauphin County, that the tax is unconstitutional by reason of its inequality.

Port Townsend Southern.—The preliminary survey for the road has now been completed for 65 miles south from Port Townsend, Wash. Ter. The location for the first 10 miles from Port Townsend is now being made, and when completed the contract for building will be let.

Rochester & Glen Haven.—Construction work has been commenced on the first section of this road from Glen Haven, on Irondequoit Bay, to Rochester, N. Y. It is expected to have the road completed this fall, and opened early next spring. It will be 3½ miles long. Emmett W. Huntington is the contractor.

St. Paul, Black Hills & Pacific.—The survey for the road has now been completed from Mandan, Dak., southwesterly for 150 miles, and two parties are now in the field continuing the line southwest to the Black Hills, which it is expected to reach this year. The contracts for building the first 150 miles of the road will probably be let next spring. The scheme is promoted in the interest of a syndicate of St. Paul capitalists. L. G. Johnson, Aberdeen, Dak., is President.

Sault Ste. Marie & Southwestern.—The Sault Ste. Marie Construction Co. has been organized by Edward J. Foster and N. C. Foster, of Fairchild, Wis.; James C. McIntire and Michael Griffin, of Eau Claire, and R. N. Foresman, of Williamsport, Pa. The intention is to build a road from Rhinelander, Lincoln County, to a point on the Mississippi River, in the county of Buffalo, near the city of Alma, a distance of 225 miles.

Savannah & Western.—The surveys from Eden westward, and from Americus eastward, have been connected at Eastman, Ga.

Southern Pacific.—The line from Templeton south will be extended at once, a distance of about 15 miles. At this point a long tunnel will be constructed, and it will take something like a year to build it. The work will progress rapidly on the tunnel and on the line toward San Luis Obispo at all convenient seasons.

The Tustin branch, which leaves the Santa Ana road at Polhemus, just below Anaheim, and runs via Orange and McPherson City to Tustin City, a distance of about seven miles, has just been opened for traffic. It has been completed for some time, but as the bridges across the Santa Ana River and the Santiago Creek had to be strengthened, some delay occurred in turning it over to the operating department.

Right of way and local aid has been secured for the extension from Victoria, Tex., southwest to Beeville, on the San Antonio & Aransas Pass, about 50 miles.

Springhill & Oxford.—Nearly all the grading on this Nova Scotia road is now completed and four miles of track have been laid. The road is being built from Springhill to Oxford, N. S., 14 miles, crossing the Intercolonial at Salt Springs, and gives better shipping facilities to Montreal and Quebec for the Springhill mines of the Cumberland Railway & Coal Co.

Tennessee Coal, Iron & Railroad Co.—The property of this company is divided into six divisions. Concerning the Pratt Mines Division, which in 1887 produced 719,000 tons of coal, a correspondent writes from Pratt Mines, Sept. 11, as follows:

"This division is making a good showing just now, and has accomplished an output for August of 84,596 tons of coal. A new shaft, No. 3, has just been opened, and promises a good field and a large increase upon the above. This new shaft, with its new machinery, new men, and in a partial disorganized state, is taking out 225 tons per day, but as it is deemed the best opening made into the fields on this division, much is expected of it. At present the Pratt Mines Division has only six slopes with four in operation, and three shafts with only two operating and three drifts beside. The company has 730 improved coke ovens, called the bee-hive. The Belgian ovens were originally used, but they have been almost universally abandoned for the bee-hive oven. These coke ovens are in continual heat, and all the coke is used for the company's furnaces in this vicinity and Birmingham.

"The company is sadly deficient in rolling stock, and it is not possible to move all the coal that could be mined and marketed at this point.

"At present there are employed on this sub-division 2,000 miners and 800 convicts. The miners are happy with the new scaling prices adopted by them during the strike, which commenced in May last and ended in July. They now get 45 cents per ton while iron is \$13 per ton; and every dollar advance in iron per ton the company agrees to pay 5 cents additional. But under any circumstances, the price is not to be less than 45 cents. This arrangement has put all the miners at work, and all is serene and happy. This body of men is largely made up of Scotchmen, though there are some Irishmen and negroes. Most of them own the houses they live in, and are thrifty and accumulating.

"The company has a contract with the state of Alabama for its convicts for ten years from January last, and during the strike the company depended upon this class of labor to obtain coal sufficient to supply the furnaces with coke, which was done without any embarrassment. The company is erecting a new prison near shaft No. 1, which is the second one built under contract with the state. The labor of these men is generally confined to all out-door work, such as ditching, piping, building many of the banks for railroad improvement and extensions. The gross income from their labor in July last insured to the state some \$6,500. Many of these are county men, with whom the state has nothing to do.

"The company has 70 miles of railroad track for all this work, but, as said above, is deficient in rolling stock. Mr. McCormack, the superintendent, is employing his energies to get this track up in condition in connection with his other duties to meet the increased output, which is sure to follow the opening of shaft No. 3. An effort will be made to open up the idle slopes, and faster communication to the mines must be made."

Tennessee & Coosa Valley.—Orders have been issued to resume work on the extension of this road, between Huntsville and Guntersville, on Sept. 25. Work was suspended last month.

Texas & Pacific.—It is reported that a branch is to be built from a point about 12 miles from Alexandria, La., westerly into heavy pine forests. The line may be continued and turned northerly to join the main line again at Provençal, which is 51 miles northwest of Alexandria.

Toledo, Columbus & Southern.—In the United States Court at Toledo, O., Sept. 11, in the case of the American Loan and Trust Co., an order was issued for the sale of the road. It extends from Toledo, O., southward to Findlay, 41 miles.

Toledo, Peoria & Western.—The annual report for the year ending June 30, just made public, shows :

Gross earnings.....	\$948,524
Operating expenses and taxes.....	749,440

Net earnings.....	\$199,084
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This would have left a surplus of \$19,084 after payment of the annual interest on the \$4,500,000 first mortgage 4 per cent. bonds had it not been for the disaster at Chatsworth, Aug. 10, 1887. In order to pay the claims arising from this disaster, it was deemed best to use for that purpose all the available resources, and, as a consequence, the interest on the first mortgage bonds, due Jan. 1 and July 1, 1888, was left unpaid. The claims amounted to \$180,000, and have now been liquidated by the Farmers' Loan & Trust Co., paying \$45,000 in cash, and by the issue of \$135,000 debenture scrip, bearing 4 per cent. interest from April 1 last, redeemable April 1, 1893, or sooner, at the option of the company. The holders of \$3,612,000 bonds have already accepted this settlement. After paying \$233,618 in liquidation of every claim arising from the accident, the company's indebtedness at present, beyond its issue of \$4,500,000 first mortgage bonds, is \$304,196.

Upper Coos.—The extension from West Stewartstown, N. H., to the Canada line at Hereford, Que., two miles, has just been finished. This completes the line from North Stratford, N. H., to the connection with the Hereford road, which is being built to Cookshire, Que., and thence to a connection with the Grand Trunk.

Victoria & Fordsville.—The Victoria Railroad, owned by an English syndicate known as the Breckenridge Coal Co., and proposed to run from Fordsville to Victoria, in Ohio County, Ky., has at last become free from the entanglement of lawsuits in which it has been engaged since the laying of its first rail, and orders have been issued to at once construct the line as proposed, a distance of 8 miles. It is intended principally as a coal road. Mr. A. A. Bulitt, of Louisville, Ky., is now securing the right of way, and expects to have the road completed within a year.

Vincennes, Oakland City & Owensboro.—The second election at Boonville, Ind., on a tax of \$125,000 in aid of this road, was lost last week, and the entire route of the road will necessarily be changed.

TRAFFIC AND EARNINGS.

The Inter-state Commerce Law.

In the House of Representatives Sept. 13, amendments to the Senate bill amending the Inter-state Commerce law were adopted, providing that in all civil actions under the law the state courts shall have concurrent jurisdiction with United States courts, and that one uniform classification shall be provided to common carriers for their guidance in making their schedules of rates, all rates not in conformity therewith being considered unreasonable; also to provide against discrimination in favor of the owners of tank cars. The bill was

then passed. On Friday the amendments agreed to in the House were laid before the Senate, and a committee of conference ordered.

Decision in the Chicago, St. Paul & Kansas City Case.

The Inter-state Commerce Commission has filed an opinion in the matter of the Chicago, St. Paul & Kansas City, which is summarized as follows: This company in June last notified the Commission that, owing to the action of competing lines concerning rates between Chicago and St. Paul and Minneapolis, it had been obliged to reduce its own rates between those points below the rates which it could afford to accept to intermediate points, so that upon its line there would be greater charges made upon the shorter haul than upon the longer in the same direction, and it stated that if complaint should be made of this it would undertake to justify its action under the Inter-state Commerce law. The Commission held an inquiry at Dubuque, at which the respondent company gave evidence tending to show that the action it had taken was forced upon it by the Chicago, Burlington & Northern, which had made a rate between Chicago and St. Paul and Minneapolis below that which would be compensatory, and it produced evidence tending to show that the Chicago, Burlington & Northern on the rates it was making was not paying operating expenses. The Chicago, Milwaukee & St. Paul also appeared, taking a similar position. The Chicago, Burlington & Northern, on the other hand, insisted that its rates were remunerative, and showed that it was accepting them without making at any point the greater charge upon the shorter haul. The evidence that its receipts were sufficient to cover operating expenses was not very strong, and it clearly appeared that for the current year it was falling behind.

The respondent company insisted that the Commission should either sanction the rates it was making to the intermediate stations between its termini, which were rates fair in themselves, or that it should order the Chicago, Burlington & Northern to increase its rates between Chicago and St. Paul and Minneapolis, so as to make them just and reasonable to the carriers themselves as well as to the public; in other words, to make them fairly remunerative; and it was insisted that the provision of the Inter-state Commerce law that all charges shall be reasonable and just was not complied with unless they were reasonable and just considered from the standpoint of the railroad company, as well as from that of the general public. The Burlington, it was therefore contended, was in constant violation of the Inter-state Commerce law in making rates so low that neither itself nor its rivals could fairly accept them.

The principal question, therefore, raised before the Commission was whether it had the power to compel the Burlington to increase its rates to a remunerative point if they were found to be below that point. This question is discussed in the opinion. The Commission claims possessing such power. It holds that Congress in the provision requiring all rates to be reasonable and just was legislating for the protection of the general public and not for the protection of railroad companies against the action of their own managers or against the unreasonable competition of rivals, and that it was never in the contemplation of Congress that it would be within the power of the Commission to order an increase in rates. In this respect it was supposed that the railroad companies had ample remedy in their own hands in the authority which they possessed to make the rates.

The further question was discussed whether the fact that the Burlington made rates which were unreasonably low constituted such a dissimilar condition under the fourth section of the act as would entitle the respondent company to make a greater charge on the shorter haul. The respondent contended that if the Commission could not control the making of destructively low rates, the competition of railroads that were subject to the law was just as harmful as was the competition of vessels, or of railroads not subject to the law and constituted a case of dissimilar circumstances. The Commission does not assent to this view. The showing of respondent is merely that a perverse rival makes unreasonably low rates to the termini of its road, but if this makes out the dissimilar circumstances and conditions intended by the fourth section of the act, then any one railroad manager in the Northwest may at pleasure, by a foolish tariff sheet, give to one or more points of railroad competition a preference and advantage over all others, and this would defeat one of the leading purposes had in view in adopting the act.

The Commission therefore finds and adjudges that the transportation of freights by respondent upon its road from Chicago to St. Paul and Minneapolis, and from such northern termini to Chicago is made under substantially similar circumstances and conditions to those under which like freights are transported on the same line from the same initial point or points in the same direction to intermediate stations; and such being the case, that the greater charges which respondent makes to such intermediate stations are illegal. An order will be entered that respondent cease and desist from making such illegal charges.

Incidentally in discussing the case the Commissioners say that they do not understand on what ground the Chicago, Burlington & Northern, while insisting that its rates from Chicago to St. Paul are remunerative, can justify charging the same rates for one-third or two-thirds the distance. Upon its own showing these rates seem to be excessive.

Traffic Notes.

The New Orleans & Northeastern, Alabama and Great Southern and Georgia Pacific will run a fast through freight line between New Orleans & Atlanta, the proposed time being 34 hours.

The roads centering in Columbus, O., have sold round trip tickets at half fare in all directions to all persons visiting the Grand Army of the Republic Encampment there on excursion tickets. Some of the Columbus ticket offices were obliged to open branch offices, and over 21,000 tickets were sold. At one office 13 clerks were "working like beavers" at 3 a. m., and the crowd of applicants was, according to a local reporter, such as to beat the ticket wagon of Barnum's circus "all hollow."

The roads from the Ohio River to southern points have recently withdrawn from Nashville merchants the privilege, which they have long enjoyed, of receiving shipments from the North and rebilling them to points farther south at rates equal to the through rate from the Ohio River to the final destination.

A dispatch from Ogden, Utah, Sept. 16, states that two train loads of fat cattle from Nevada and Oregon had passed through that city destined for Chicago. The cattle were in palace stock cars, in which they were fed and watered on the road, and they were taken through on "silk-train time."

On the application of the watermelon growers, who complain that their business the past season has been unprofitable, the Rate Committee of the Southern Railway & Steamship Association has recommended that in future watermelon rates be made on a basis of 8 mills per ton per mile on shipments to the Ohio and Mississippi rivers and 7 mills per ton per mile to points beyond; the minimum weight to be 12 tons per car. At the hearing on the matter it was stated that the crop shipped this year had amounted to about 4,000 carloads, which paid on the average \$100 per car. The yield per acre is about one-half carload, or about 50 times the weight of cotton raised on the same area.

The Railroad Commissioners of Kansas have just rendered a decision in a complaint against the Chicago, Kansas & Nebraska, concerning car-load rates on mixed live stock. The legislature had made a law that two or more kinds of stock in the same car should not be charged at a higher rate than for a similar car containing only one kind, providing, however, that in case one of the kinds was classified higher than the other, the highest rate might be applied to the whole car. The railroads had made a rule that mixed car loads should be charged for at actual weights, minimum 10, tons, and all excess over that to be charged for at a proportionate rate. No such rule, was made, however, concerning straight loads and the Commission, therefore, finds that complainants have been overcharged. A long car might contain 12 or 15 tons of cattle, but would be charged only at the car-load rate, while if it contained a mixed load all in excess over 10 tons would be charged additional.

The roads entering Chicago from the west, northwest and southwest have agreed upon rates to apply to live stock shipments under the weighing system. The rates will go into effect Oct. 10 and will be as follows per 100 lbs:

	Cattle.	Sheep.	Hogs.
From Omaha.....	27½	27½	27½
" Kansas City.....	27½	27½	25
" St. Paul.....	25	30	30

Transcontinental Rates.

Chicago shippers are still complaining of the new tariff of the California lines. When they complained of the recently issued tariff, the association agreed to consider the feasibility of adopting commodity rates on a number of articles from Chicago to Pacific Coast points in order to bring about an equality between New York and Chicago shippers in the Pacific Coast markets. The Chicago merchants now say that Chairman Leeds has issued a supplementary tariff, which gives them rates on only 16 articles out of 100 which they wished to have included, and also that rates from St. Louis are unduly favorable to that city as compared with Chicago.

Trunk Line Rates.

On Sept. 12 the Pennsylvania announced a reduction of 5 cents in grain rates from Chicago to New York, making the rate 20 cents, with corresponding differentials to Philadelphia and Baltimore. There was no explanation of the reason for this reduction, and the Baltimore & Ohio and Lake Shore at once made similar changes. It was stated that the action of the Lehigh Valley in accepting less than the agreed proportion on Lake grain from Buffalo to New York was the cause of the Pennsylvania's action, but this was mere rumor. On Monday it was announced in Chicago that the Baltimore & Ohio and Lake Shore had decided to restore their rates to 25 cents, the large amount of traffic offering being in excess of the available supply of cars, had convinced these roads that the reduction was in every way unreasonable.

On Sept. 14 the Pennsylvania and Vanderbilt lines announced an advance of dressed beef and cattle rates to take effect Sept. 24. Dressed beef is placed at 35 cents and cattle 15 cents to New York. The Chicago & Grand Trunk followed on Monday with a notice that dressed beef rates would be advanced on Sept. 28 to 35 cents from Chicago to New York and Boston.

The presidents of the trunk lines will meet in New York to-day to consider the question of raising through rates. Chairman Blanchard is reported as saying that the roads would not agree upon a permanent restoration of rates until after this meeting.

Western Rates.

Negotiations concerning rates in the territory west and northwest of Chicago are still in a highly complicated and unsettled condition. The roads from the Northwest which have lines beyond Minneapolis have milling-in-transit rates to which the roads having lines only between Minneapolis and Chicago will not agree.

The western and southwestern sections of the Western States' Passenger Association have encountered a difficulty in their new agreement in the refusal of the Chicago & Alton to discharge the eastern special agents until the trunk lines consent to restore the sale of through tickets over its lines. It claims to be unable to secure its share of business at present without special agents. Other roads contend that the Alton is paying larger commissions to these agents than they are permitted to pay, which gives it an advantage over other lines. A committee was appointed to confer with the trunk lines.

The Kentucky & Indiana Bridge Case.

The opinion of Commissioner Schoonmaker, dissenting from the majority of the Inter-state Commerce Commission in the matter of the Kentucky & Indiana Bridge Co. against the Louisville & Nashville Railroad Co., has been published. The majority held that the bridge company is a common carrier doing an inter-state business, and on this theory it was ruled that the railroad could not lawfully refuse to receive freight brought over the new bridge. Commissioner Schoonmaker takes the ground that the bridge company is not a common carrier, and that the railroad is not bound to give it equal facilities with those given to carriers; that the consent of the Louisville & Nashville company to interchange local freight at the track at Fourth street and Magnolia avenue, instead of at its regular yards, is reasonable, and satisfies so much of the petitioner's complaint as it can rightfully make; that the demand for interchange of through traffic with the Ohio & Mississippi should be made by the latter company, and not by the bridge company, but that the demand in behalf of that company for interchange from the Kentucky & Indiana or new bridge cannot be sustained, because all reasonable and proper facilities are afforded in case the traffic is carried over the old bridge. He is of opinion that the contract made in 1872 between the Louisville Bridge Co., the Louisville & Nashville and Ohio & Mississippi for the use of the bridge for through traffic is a valid contract, and not affected by the Inter-state Commerce act.

Baggage Storage.

The Minnesota Railroad Commissioners have, on complaint against the St. Paul Union Station, recommended that fees for storage at railroad baggage room be reduced to a uniform charge of 10 cents per day on each trunk, chest or box, not counting the first 24 hours, or that no charge be made for the first 48 hours, but to remain as at present after the expiration of that time. They also think that there might be some difference in the charges collected upon small hand baggage.

Illinois Central Earnings.

The statement of the Illinois Central for the month of August, 1888, shows: Gross earnings, \$953,545; mileage, 1,953; 1887, \$975,099; lines in Iowa (operated up to Sept. 30, 1887, by Illinois Central Railroad Co., lessee), \$149,686; total, \$1,124,785; mileage, 2,355. Jan. 1 to Aug. 31, 1888, \$7,279,933; mileage, 1,953; 1887, \$7,162,572; lines in Iowa, \$1,011,467; total, \$8,174,039; mileage, 2,355. Dubuque & Sioux City, month of August, 1888, \$63,401; Cedar Falls & Minnesota, \$9,390; both roads, 218 miles, \$72,791. Jan. 1 to Aug. 31, 1888, Dubuque & Sioux City, \$509,912; Cedar Falls & Minnesota, \$61,336; total, \$571,249. Iowa Falls & Sioux City, 184 miles, month of August, \$52,400; Jan. 1 to Aug. 31, \$496,598.

Second-class Sleepers.

Below is the circular of General Passenger Agent J. S. Tebbets, of the Union Pacific, announcing a change in sleeping car arrangements on through Pacific Coast trains:

"Arrangements have been completed between the Southern Pacific Co. and this company for a daily family sleeping car service between Council Bluffs and Los Angeles, each company furnishing its quota of first-class modern cars, the Southern Pacific's quota being in charge of and fitted up by Mr. Eli Denison, Oakland, Cal., and this company's quota by Messrs. Barkalow Brothers, Omaha. These cars will be fitted up complete with mattresses, curtains, blankets and pillows, requiring nothing to be furnished by passengers. Uniformed porters will accompany these cars, whose duty will be to keep the cars in good order, and attend to the wants and comfort of passengers, same as Pullman porters. A charge of \$2.50 for an upper or lower half section will be made between Council Bluffs and Los Angeles, and a maximum charge of 50 cents per night between intermediate stations. Only passengers holding second-class tickets will be allowed to occupy these cars. No smoking will be allowed in these cars. Accommodations for cars on this line can be secured in advance (same as Pullman accommodations) through M. J. Grevy, Passenger Agent at U. P. transfer and tickets for space will be on sale in our offices at Council Bluffs, Omaha and principal offices along the line."

"These cars will commence to run Sunday, Sept. 9, and daily thereafter, leaving Council Bluffs on train No. 1, 'The Pacific Express,' and running through to Los Angeles without change."

Yellow Fever.

The earnings of nearly all the roads entering the state of Florida show a decided falling off during the past month over the corresponding period last year. The yellow fever scourge, says a local paper, has ruined passenger travel on roads leading to Florida, and has paralyzed freight business completely. Lines that do not go within 300 miles of Florida have also suffered from the evil effects of the disease. Travel to the South is unusually light, and only those who are compelled to go on account of business travel towards Florida now. The decrease in gross earnings for the roads in Alabama that lead to Florida is 13 per cent.

Cotton Movement for the Year.

The *Commercial and Financial Chronicle* gives the following summary of the receipts and exports of cotton for the year ending Sept. 1.

It will be seen that the total crop this year reaches 7,017,707 bales, while the exports are 4,638,981 bales, and the spinners' takings are 2,230,494 bales, leaving a stock on hand at the close of the year of 181,225 bales. The first table indicates the stock at each port Sept. 1, 1888, the receipts at the ports for each of the past two years, the export movement for the past year and the totals for 1886-'87 and 1885-'86.

	Receipts for year ending Sept. 1,	Exports year ending Sept. 1,	Stock Sept. 1,
Louisiana	1,780,375	1,764,151	1,522,687
Alabama	207,377	216,142	62,488
South Carolina	441,825	389,604	1,693
Georgia	960,927	835,593	440,230
Texas	689,701	754,252	333,956
Florida	34,960	27,212	3,446
North Carolina	23,552	196,637	380
Virginia	976,314	815,391	467,761
New York	97,584*	97,307*	918,981
Boston	98,306*	105,417*	241,727
Baltimore	55,161*	60,484*	164,111
Philadelphia, etc.	27,560*	58,534*	73,831
Portland, etc.	.....	.....	2,355
San Francisco	.....	239	.....
Totals, this year.	5,602,632	4,638,981	181,225
" last year.	5,320,624	4,458,326	82,086
" pre year.	5,396,686	4,343,991	173,728

*These figures are only the portion of the receipts at these ports which arrived by rail overland from Tennessee, etc.

Of this crop 2,793,848 bales went to Liverpool. By adding the shipments from Tennessee and elsewhere direct to manufacturers, and Southern consumption, we have the crop statement for the three years as follows:

	Year ending Sept. 1,	1887-88.	1886-87.	1885-86.
Receipts at the shipping ports, bales	5,602,632	5,320,624	4,458,326	82,086
Add shipments from Tennessee, etc., direct to manufacturers	971,702	795,070	813,529	.....
Total	6,574,334	6,115,694	6,210,215	.....
Manufactured South, not included above	443,373	397,929	340,000	.....
Total cotton crop for the year, bales.	7,017,707	6,513,623	6,550,215	.....

Anthracite Coal Tonnage.

The official statement of the production of anthracite coal in August and for the first eight months of the year is as follows :

	August.	1888.	1887.	Inc. or Dec.
Phila. & Reading	876,017	703,232	I.	172,785
Lehigh Valley	706,428	574,876	I.	131,551
Central of N. J.	623,816	491,125	I.	132,691
Del. Lack. & West.	726,659	520,978	I.	205,681
Del. & Hud. Canal Co.	456,311	356,722	I.	109,589
Pennsylvania	459,741	355,978	I.	104,762
Pennsylvania Coal Co.	187,325	147,388	I.	39,938
N. Y., L. E. & W.	61,262	58,423	I.	1,839
Total.	4,097,562	3,198,725	I.	898,833
	Eight months.	1888.	1887.	Inc. or Dec.
Phila. & Reading	4,120,735	4,029,954	D.	509,223
Lehigh Valley	4,067,027	4,229,854	D.	102,826
Central of N. J.	3,525,091	3,260,501	I.	264,582
Del. Lack. & West.	4,326,504	3,481,912	I.	844,592
Del. & Hud. Canal Co.	2,846,979	2,388,816	I.	458,162
Pennsylvania	3,058,583	2,416,986	I.	641,597
Pennsylvania Coal Co.	1,07,292	947,858	I.	149,434
N. Y., L. E. & W.	577,086	507,908	I.	69,178
Total.	23,619,290	21,863,795	I.	1,755,495

The stock at tide-water shipping points Aug. 31, 1888, was 396,752 tons; on July 31, 1888, 704,101 tons; decrease, 307,359 tons; August 31, 1887, 629,415 tons.

Coal.

The coal tonnages for the week ending Sept. 15 are reported as follows :

	1888.	1887.	Increase.	P. c.
Anthracite	935,523	639,127	296,394	46.4
Bituminous	332,476	303,008	29,468	9.7

The Cumberland coal trade for the week ending Sept. 15 amounted to 72,781 tons, and for the year to that date 2,496,884 tons.

Cotton.

The cotton movement for the week ending Sept. 14 is reported as follows, in bales :

Interior markets	1888.	1887.	Decrease.	P. c.
Receipts	33,922	77,524	43,002	56.2
Shipments	30,459	59,706	29,307	49.0
Stock	21,291	53,512	31,221	59.4
Seaports				
Receipts	45,691	126,041	80,350	63.8
Exports	29,405	31,371	1,906	6.0
Stock	186,137	192,752	6,615	3.4

Railroad Earnings.

The statement of the Nashville, Chattanooga & St. Louis for the month of August, and the two months ending Aug. 31, is as follows:

Month of August:	1888.	1887.	Inc. or Dec.
Gross earnings	\$272,184	\$272,481	D. \$297
Oper. expenses	156,103	144,591	I. 9,512
Net earnings	\$116,081	\$125,889	D. \$9,808
Interest and taxes	77,984	78,675	I. 701
Surplus	\$38,096	\$47,204	D. \$9,108
Two months:			
Gross earnings	\$534,769	\$531,358	I. \$3,411
Oper. expenses	306,351	277,629	I. 28,722
Net earnings	\$238,417	\$253,729	D. \$25,312
Interest and taxes	154,950	162,058	I. 7,108
Surplus	\$73,496	\$91,671	D. \$18,205

The earnings and expenses of the Richmond & Danville system for month of August are as follows:

Month of August:	1888.	1887.	Inc. or Dec.
Gross earnings	\$744,171	\$672,905	I. \$71,265
Oper. expenses	432,730	425,030	I. 27,699
Net earnings	\$291,431	\$247,865	I. \$43,568

The earnings and expenses of the Richmond & Danville system for month of August are as follows:

Month of August:	1888.	1887.	Inc. or Dec.
Gross earnings	\$11,477,426	\$11,799,837	D. \$10,779,599
Expenses	8,571,431	7,737,639	I. 6,036,445
Net earnings	\$2,905,995	\$4,063,198	D. \$2,843,154
Fixed charges	2,636,578	2,597,099	I. 2,797,181
Balance	\$269,417	\$1,465,099	I. \$1,045,973

In 1888 the percentage of operating expenses to gross earnings was 74.1% against 65.5% in 1887.

Earnings of railroad lines for various periods are reported as follows:

Month of August:	1888.	1887.	Inc. or Dec.
Cape F. & Y. V.	\$28,05	\$22,326	I. \$5,699 25.6
Net	13,504	10,821	I. 2,743 25.4
Mar., Col. & Nor.	8,042	7,189	I. 853 1.8
Net	3,045	2,367	I. 378 11.4
Nash., C. & St. L.	272,185	274,481	D. 206 0.1
Net	116,081	125,890	D. 9,809 7.5
Prescott & A. C.	10,851	8,310	I. 2,544 30.6
Net	7,225	5,181	I. 2,044 39.3

The following table of earnings and expenses of the Chicago & Northwestern for the six months ending June 30 has been published:

Jan. 1 to June 30:	1888.	1887.	Inc. or Dec.
Gross earnings	\$245,622	\$186,119	I. \$59,503 31.9
Expenses	193,846	132,000	I. 33,003 18.0
Net	52,175	52,175	I. 0 0.0

The following table of earnings and expenses of the Chicago & North Western for the six months ending June 30 has been published:

Jan. 1 to June 30:	1888.	1887.	Inc. or Dec.

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